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AMERICAN ARTISAN and Hardware Record

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Why YOU should use "Armco" Ingot Iron

Your future business prosperity depends upon the foundation on which you are building. There is no surer way to build this foundation in your business than to guard against the use of inferior materials.

There are a certain number of working hours in a day. You have a certain capacity for work, whether it be personal work or guiding the work of others. All the money you make is dependent upon yourself and the number of working hours in a day. Therefore, every job you do should not only pay you a good profit, but should also be a means of bringing more work to you by representing the kind of work you do.

What you do today, if done right, brings you more work and more profit years from now. It is the greatest testimonial you have to your ability as a sheet-metal worker. It is your advertisement to everybody who needs sheet-metal work done.

Can you afford then to use materials that will not stand up as long as they should, in hard service? Are you willing to risk your future reputation and business by using metal that is inferior to rust-resisting "Armco" Ingot Iron?

It does not take much salesmanship as a rule to show the people you are planning to work for why they should use "Armco" Ingot Iron, even though the first cost is a little more than that of an ordinary sheet metal. You can convince them that it will be actually much cheaper in the long run. And so every job you do will really mean more business if you can persuade them to use "Armco" Ingot Iron; more money will be involved in it—and more profit.

The pure base metal of "Armco" Ingot Iron makes it easy to form, and the galvanized coating adheres so tenaciously that severe forming and bending operations do not cause it to crack or peel.

Among the many reasons why you should use "Armco" Ingot Iron, do not overlook those which are so important to *you*.

THE AMERICAN ROLLING MILL COMPANY, Middletown, Ohio

ARMCO
TRADE MARK
INGOT IRON
Resists Rust

GILT EDGE

The Furnace That Is Easier to Sell

SELLING furnaces is not an easy game, but why not make it easier by selling a furnace that cuts down sales resistance?

The Gilt Edge line will do it—it's a clean, sturdy, carefully finished product, whose very appearance makes a favorable impression upon your customer, it's made right—built for service and durability—designed so as to deliver the maximum heating service from fuel consumed. A furnace that has earned a reputation for quality and dependability through forty-five years of consistent satisfaction giving. A furnace that has back of it an institution that aims to work with and for the dealer for the development of his business and extends to the purchaser all the benefits of the Gilt Edge Home Owners Heating Service, so as to assure the satisfactory operation of every Gilt Edge Heater.

A sale plan that aims to sell furnaces for the dealer and not only to the dealer, an intensive advertising campaign to feature Gilt Edge Furnaces in the territory actually served by Gilt Edge Dealers. It is the combination of high grade product and real honest to goodness sales co-operation and service between factory and dealer that makes the Gilt Edge Agency a profitable business builder.

It will pay you to find out more about the Gilt Edge dealers proposition—a letter will bring you full particulars, write us today.

R. J. SCHWAB & SONS CO.

279 Clinton Street **MILWAUKEE, WIS.**

Founded 1880 by Daniel Stern

Thoroughly Covers the Hardware, Stove, Sheet Metal, and Warm Air Heating and Ventilating Interests

AMERICAN ARTISAN and Hardware Record

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VOL. 84. No. 9. CHICAGO, AUGUST 26, 1922. $2.00 Per Year.

ADVERTISING WILL HELP YOUR BUSINESS EVEN IN DULLEST PERIODS.

In the state of Illinois, there were sold something like 100,000 automobiles in 1921.

It would be interesting to know how many of these 100,000 automobiles would have found their way into use if all automobile advertising had been discontinued from October 1920 to December 1921.

And strange to say, more than one automobile manufacturer could truthfully report that his sales were larger in 1921 than in any previous year!

It certainly was not a fact that buyers could not have managed to get along without new machines, for important and convenient as automobiles are, they have not yet reached the stage where they can be classed as absolute necessities, like bread, sugar, shoes, shirts, stoves, ranges, etc.

And yet, one out of every twelve heads of families bought a new car in Illinois in 1921!

So there must have been a lot of money spent for automobiles in 1921, which would not have been spent if the automobile manufacturers had taken the same position as did so many manufacturers, wholesalers and retailers in other lines.

Of course, advertising was not the only cause for the big amount of new business. The personal selling effort had a large share in the credit, but it certainly does look reasonable to the impartial observer that where, for example, two automobile manufacturers—the Studebaker and the Franklin companies—could report large increases in sales, as against actual decreases by other automobile manufacturers in the same territory, and when comparatively little advertising was done by those who lost business, some of the big gain—and a large share of it—must be credited to the fact that these two manufacturers carried out an aggressive advertising campaign.

Now—we have nothing against automobiles, nor do we say that manufacturers in this line induced people to spend money for non-essentials in times when those buyers ought to save their money or spend it only for essentials.

But we want to impress it upon you—Mr. Manufacturer, Mr. Wholesaler and Mr. Retail Merchant—that if you had gone after business in your line with the same vim and confidence your sales and profits would have been considerably larger in 1921—and in 1922.

Some of you have seen the light, and we know that you are reaping satisfactory results, but there are still too many among you who haven't even started to loosen the hard knots you tied on your purse strings in the fall of 1920.

You are losing money by holding back.

The strikes in the coal and railroad fields will interfere somewhat for some time with the return of real prosperity.

But whatever business there is to be gotten this fall will go in the largest measure to the man who goes after it with real, aggressive advertising.

Random Notes and Sketches.

By Sidney Arnold

Even if you have read the words before, it will do you good to read again Elbert Hubbard's sentences on initiative. Here they are:

The world bestows its big prizes, both in money and honors, for but one thing.

And that is Initiative.

What is Initiative?

I'll tell you: It is doing the right thing without being told.

But next to doing the thing without being told is to do it when you are told once. That is to say, carry the Message to Garcia; those who can carry a message get high honors, but their pay is not always in proportion.

Next, there are those who never do a thing until they are told twice; such get no honors and small pay.

Next, there are those who do the right thing only when necessity kicks them from behind, and these get indifference instead of honors, and a pittance for pay. This kind spends most of its time polishing a bench with a hard-luck story.

"Then still lower down in the scale than this, we have the fellow who will not do the right thing even when some one goes along to show him how and stays to see that he does it; he is always out of a job, and receives the contempt he deserves, unless he happens to have a rich Pa, in which case Destiny patiently awaits around the corner with a stuffed club.

To which class do you belong?

* * *

Gus Engelhardt, who has for, lo, these many years, been one of the wheel horses of the Chicago Hardware men, has a little boy friend, about four years old. Bobbie was stroking his kitten in front of the fireplace in perfect content. The cat, happy also, began to purr and Bobby dragged her hurriedly and roughly away from the hearth.

"You mustn't hurt your kitty, Bobby," his mother interposed.

"I'm not," protested the young natural historian, "but I've got to get her away from the fireplace; she's beginning to boil."

* * *

In several cities, when you want a supply of gas for your kitchen stove, you put a twenty-five cent piece in the slot of your gas meter.

This fact forms the basis and explanation of a brief conversation between two Scotchmen, related by Loyd Scruggs, president Copper Clad Malleable Range Company, St. Louis, Missouri:

"I gi'e the wee laddie a shullin' pocket money every week."

"Mon, that's a lot for him!"

"Aye. But I mak' him put it in the gas-meter. He thinks it's a money-box!

* * *

Allan Coleman, ex-president Hardware Club of Chicago, finds fun in this venerable tale—and so do I:

A Dutchman, addressing his dog, says:

"My dog, you haf a snapp. You vas ondly a dog, and I vas a man, but I vish I vas you. You every vay haf de best of it. When you go mit to bed you just durn round t'ree times and lay down. When I go mit to bed I haf to lock up de place, wind up de clock, but de cat oudt, undress myself, and then my wife up and scold me, and the baby cry, and I walk up and down, und then maybe when I just go to sleep it's time to get up again.

"When you get up you just stretch yourself and then scratch yourself a coople of times und then you vas up. I haf to light de fire, put de kettle on, scrap some vid my wife, and maybe get some breakfast.

"You play all day und haf plenty uv fun; I work all day and haf plenty of drouble. When you die you vas dead. When I die I'se got to go to hell yet."

Paul E. Heller of Heller Brothers Company, Newark, New Jersey, tells of a youthful lawyer who had been retained to defend an old offender on the charge of burglary.

The rules of the court allowed each side one hour in which to address the jury.

Just before his turn came the young lawyer consulted a veteran of the bar who was in the court room.

"How much time," he asked, "do you think I should take in addressing the jury?"

"You should," answered the old timer without hesitation, "take the full hour."

"The full hour! Why, I thought I should take something like a quarter of an hour."

"You ought to take the full hour."

"Why?"

"Because the longer you talk, the longer you will keep your client out of jail."

* * *

It takes 65 muscles to frown. But it requires only 15 muscles to smile. Hence only a small effort is needed for you to get pleasure out of this story related by John C. Henley of Tanner & Company, Indianapolis, Indiana.

Roy Simpson, negro laborer, was putting in his first day with a construction gang whose foreman was known for getting the maximum amount of labor out of his men. Simpson was helping in the task of moving the right-of-way and all day long he carried heavy timbers and ties until at the close of the day he was completely tired out.

Came quitting time. Before he went he approached the boss and said:

"Mister, you are sure you got me down on the payroll?"

The foreman looked over the list of names he held. "Yes," he said, finally "here you are—Simpson—Roy Simpson. That's right, isn't it?"

"Yaas suh, boss," said the negro, "dass right. I thought mebbe you had me down as Samson."

The Latest News About Stoves and Ranges

Items and Discussions of Interest to the Manufacturer and Retailer of Kitchen Ranges, Heating Stoves and Accessories.

Gives Instructive Facts About Mica Used in Stoves.

Do you remember how you used to sit before the old barrel stove in the parlor or before that "new fangled" base burner, watching the glow of the cheery winter fire through the "isinglass" windows?

You may think that since the basement furnace has generally supplanted the troublesome pesky things the producers of "isinglass" must have long since gone bankrupt; but there is more demand for it now than ever before, says the United States Bureau of Mines.

Anyway, it was not isinglass at all in the front of the stove.

Had it been it would have lasted only as long as paper, for isinglass is made of the air bladders of certain fish and is a soluble combustible substance.

What really was in the stove windows was mica, one of the oddest of natural substances, and which is now one of the greatest boons in the electrical industry as a perfect insulator.

So important is mica in electrical goods, it is declared, that many of the larger electrical supply manufacturing companies own and operate their own mica mines.

Mica, says the Bureau, includes a group of several minerals characterized by a perfect basal cleavage by virtue of which they may be split into exceedingly thin plates.

How often, as a youngster, did you make wonderful finds of "gold" or "silver" among the rock deposits near the homestead?

Of course, the dreams of wealth vanished when you found the silvery or golden flakes were only mica.

Such mica has no commercial value, it is only valuable when it occurs in large deposits where it appears in "books" fairly free from defects, varying in width and length from a few inches to feet and up to six inches or more in thickness.

Of the several varieties of the mineral only two are of commercial value, the "muscovite" or white mica, and the "phlogopite" or amber.

India, Canada and the United States are the chief producers.

Mica possesses a combination of special qualities which is found in no other substance, consequently no satisfactory substitute has been found.

Chief among these qualities are elasticity, toughness, flexibility, transparency, ability to withstand excessive heat and sudden changes of temperature, high dielectric strength, cleavability, and resistance to decomposition.

An important use of electrical mica is for interleaving between the copper segments of commutators.

Thin films are used in vast numbers in condensers, for magnetos and in wireless apparatus.

As sheets in greatly diversified shapes, or as washers and tubes, mica is used extensively as an insulator in dynamos and in various appliances, in fuse boxes, sockets, insulators, electric heaters, flatirons, telephones, etc.

As a heat-resisting, transparent medium, sheet mica is still used in furnace sight-holes, for heat screens, lamp chimneys, canopies and shades, particularly for gas mantles, also for military lanterns and lantern slides.

Its ability to withstand strains and shocks, combined with its transparency, has led to wide use in motor goggles, spectacles, divers' helmets, smoke helmets, compass cards, gauge fronts, and in windows subject to shock such as on the conning-towers of battle ships.

Owing to the resonance of mica circular sheets of high grade muscovite are used extensively in phonographs as sound producing devices.

Such sheets are also used in other sound detecting devices such as the submarine detectors.

The brilliancy of its reflecting surfaces gives the mineral a wide use as a decoration, notably as Christmas tree "snow."

Coarse ground mica is also used for ornamentation of pottery, lamps, curtains, cloth, and in India in decorating the temples.

An unusual use for the ground product, which, says the Bureau of Mines, "fortunately has not extended outside India," is in medicinal preparations and wound dressings.

The recent development of wide uses for the ground product has opened a wide field for utilization of waste and scraps, and saved the industry much expense.

The more impure and coarser types are used as a coating to prevent tar roofing from sticking when rolled; purer and finer grades are used in paints, ornamental tiles.

A mixture of ground mica and powdered aluminum is said to make a rust-preventing paint of good quality.

On account of its heat-resisting quality it is used extensively in railroad car axle packing, in pipe and boiler coverings, in fireproof paints, and even in rubber tires.

Ground mica is also used in annealing steel, as an absorbent, for nitroglycerin in the manufacture of certain explosives, as a component in roofing, as a filler in rubber and other products, in calico printing and as tire powder.

The purest and finer powder is used for wall paper decorations, as a lubricant for wood bearings, and mixed with oil as a lubricant for metal bearings.

It has been found that mica may also be used successfully as a flux in ceramic wares.

Stove Dealer Finds Out What Women Look for When They Want a Kitchen Range.

Ornamental Design and Attractive Appearance Are Secondary in Their Minds to Good Baking Qualities.

THE farther away you get from the folks, the less you know about life.

The less you know about life, the less you know about selling goods.

In the matter of merchandising stoves, the most important factor of all is to know what the people think—not what editors of newspapers, paragraph writers, and so-called moulders of public opinion think, but what the people themselves think.

A hardware dealer who has one of the most prosperous stove departments in the country is always on the lookout for genuine expressions of the mind of the folk.

The other day he had occasion to call at a certain office and while waiting to transact his business, fell into conversation with the young lady at the reception desk.

She happened to be a regular human being without the artificialities and mannerisms which put a coating of cement twenty-five feet thick around the brain and keep out all new ideas.

So he said to her:

"What does your mother look for when she buys a stove?"

Without a moment's hesitation she answered:

"My mother wouldn't look at a stove unless it was a good baker."

Further conversation revealed the interesting fact that her mother did not care how many doodaddles the stove had or what kind of ornaments, whether it had rounded corners or square corners, or whether it was made of cast iron or of monel metal.

She wanted a stove that would do good baking.

And the stove dealer who could fool her into taking a stove that would not do good baking would have to pay up his life insurance ten years in advance, lock up his store, say goodby to all his friends, and keep traveling until he hit the north pole if he wanted to avoid the wrath of this lady who insisted on having the right kind of a stove because she could not be deceived.

He might talk her into having the stove delivered and set up, but if it didn't perform properly, if it did not enable her to do good baking—and incidentally she is an artist in baking—she would not allow it to remain in her house.

Now, as a dealer in stoves you have certain obligations to the public.

If you are going to stay in business you must honestly and continuously serve your patrons.

You are in business to make profit, it is true, but you are also in business to minister to the wants of the people.

Hence, it is a thing of utmost importance for you to select a line of kitchen ranges which has the reputation for uniform excellence and unvarying satisfaction.

Of course, cases will arise where the stove itself is not at fault.

Now and then a newly wed spouse lights the oven of a kitchen range for the first time in her life.

She follows the direction of the domestic cook book blindly and without understanding.

She may forget to put in some essential ingredient or let the oven get too hot or open the oven before the right time, and ruin a batch of biscuits, or a cake, or a pie.

That's not the fault of the stove nor is it your fault.

But with comparatively few exceptions, most people can do good baking with a good stove.

It's up to you to sell good stoves—stoves that will do good baking.

Now, after having determined these essential things, you can make your secondary appeals to the artistic sense of your customers.

A good stove which does reliable baking need not be ugly nor clumsy.

You can get a line of cooking stoves which combine utility and uniformly high satisfaction with pleasing design.

When you have all these and when you keep constantly in touch with the folk and know the people, you will sell stoves in gratifying quantities.

Klein Stove Company Moves to New Quarters in Philadelphia.

The Klein Stove Company, manufacturers and wholesale distributors of stoves, furnaces and refrigerators, are now located in their new offices at 60 North Second Street, Philadelphia, with warehouses at 203-215 Cuthbert Street, where they are prepared to serve the trade in their usual, careful and efficient manner.

Elgin Stove and Oven Company Doubles Capital Stock.

The Elgin Stove and Oven Company, Elgin, Illinois, which will begin construction of a new $90,000 factory building on North State street next month, has doubled its capital stock.

The capital stock has been $125,000, but is doubled to $250,000 to allow for the construction of the new building. Chase and Cole, Chicago architects, are now drawing plans for the Elgin industry's new home and contracts will be let early in September.

The growth of the Elgin Stove and Oven Company has been rapid. A few years ago its first products were turned out in a second-floor factory on River street. From its small beginning it has expanded until it has outgrown its North street factory.

Fred W. Dieterich, Herbert M. Dieterich and Frank W. Shepherd are directors of the concern, the latter also being attorney for the company.

The results of good business methods show only when you stick to those methods. There is no immediate jump as a result of them.

To Many Dealers the Word Credit Is More Deadly Than the Sting of an Adder, When Applied to Open Accounts.

The Old Time Methods of Handling Charge Accounts Have No Place in the Retail Merchandising Plans of the Present Day.

By B. Christianson, Assistant Secretary Wisconsin Retail Hardware Association.

LOOK back over 1921. Was your *credit* business, for we will still call it *credit,* satisfactory, or was it a failure?

What is your verdict?

I can read it in your eyes. Yes, and I can read it in every trade paper, and some that are not trade papers.

You are not satisfied with it. Money is hard to get even from a bank, which has lots of it. Then how can you expect it to be easy to collect from your customers, many who do not have any.

Then what is wrong with this *credit* business and again we use the word *"credit?"* Two things are wrong.

First, it is yourself. To find the real cause of your failure to materialize "fair profits" from your charge accounts, stand squarely in front of a good clear mirror and open both your eyes and you have found it. And I am going to tell you why a little later.

Again the second thing that is wrong with the credit business is the name, "credit." That deathly word, "more poisonous than the sting of an adder" to many retailers is all wrong when applied to the charge accounts of a retail merchant. The extending of credits isn't merchandising. When you do that you are getting into another line of business. *Your business is to sell merchandise with or without the aid of customers accounts, at a profit. To sell goods,* that is the aim, object, and purpose of merchandising, but again I say "It is not to sell credit."

Now where do I draw the line? When is a credit not a credit? Listen, whenever any account is permitted to run beyond the time at which it is supposed to be settled, you begin to finance the customer to the extent of the amount involved, and immediately you are beginning to extend credit.

You are getting into another and a distinct line of business which you are not fitted for either by education or financial circumstances.

Old-time methods of handling charge accounts have no place in the retail merchandising plan of today. Hear what Fred P. Mann of Devil's Lake, North Dakota, a colossal figure in the world of successful retailers, had to say, when he addressed the Retail Merchants' Association of his state as its President:

> It is estimated that at least 65 per cent of the merchants in North Dakota are today *insolvent,* for the reason that they have been doing business under the old slip-shod manner, using the open book account system of credits, and that today the average book account is not worth fifty cents on the dollar, and in many instances it is estimated that 75 per cent of the average book accounts can not be collected.
>
> He further states: I want to advise all members of our Association to adopt strictly modern up-to-date methods as applied to their business and specially in the credit department, and to begin to sell for cash, or on a strictly thirty-day basis.

Mr. Mann conducts two stores, one doing strictly *cash* business and the other a short-term or thirty-day charge business. Both stores are making money.

In connection with the charge accounts of retailers there are three things that force themselves on our attention.

We may better deal with them now, than to enjoy the pipe dreams of the one who eliminates the troubles of the present by forgetting about them, thus hoping to find them gone when he again comes down to earth. And does he? Does the ostrich find the danger gone as he takes his head out of the sand. No!

So I am going to deal gently perhaps with the cure for the looseness, and liberality of the present charge system in retail stores. I am going to try to prove to you that the solution lies in observing the following three distinct merchandising plans:

Definite business terms.

Wise selections of charge accounts.

Systematic collection methods.

How many can state definitely just what amount is due them on accounts receivable, or what amount is due them at any time of the month or the year?

How many of you know that your rating as a financial risk is seriously interfered with if your books show over three months' business charged up as customers accounts, owing you? When you go back to your different stores, look this up immediately and if you are carrying more than a sixty-day business on your books, get busy.

There are 365 opportunities of 24 hours each for you to do better in 1922 than in the year gone by, and you ought to begin by laying a definite plan for the handling of customers accounts, before doing another thing.

A plan in this department is just as necessary as a plan for selling, or advertising, or even in your buying, and many of you wouldn't do without a plan in connection with the departments I named.

In Wisconsin our organization has gone on record as favoring a plan which reads like this:

> We will allow a discount of three per cent on all cash sales of one dollar and over.
>
> We will allow a discount of two per cent on all accounts paid on or before the tenth of the month following the date of purchase.
>
> All regular bills not discounted in any of the above-mentioned manners will be due and payable net in thirty days.
>
> All bills for contracts and for labor

and other special items, figured or quoted on net cash basis, are not subject to the above cash discount and are due as above unless by special arrangement.

Interest at six per cent will be charged on all unpaid accounts after sixty days.

There will be variations in amount of discounts, time before drawing interest, and due dates of the accounts as long as merchants like other people differ. But that is not anything to worry about.

What we have brought about through fifty-eight group meetings and two State Conventions, is a general appreciation of the value of shorter credit terms and the encouragement of greater cash business, at the customer's option. These terms or others, similar in nature, will increase your cash business.

They have increased the cash taken in over the counter in different sections of our State, and it is safe to say it will do so in your own state.

I haven't any great patience with men like the Association Secretary who recently wrote these words, "The cash customer is not always as welcome as he thinks." I will say this as I look back over the years I spent while an owner and manager of three hardware stores, that I always welcomed them and their patronage and stand ready to do so again were I to engage in the retail hardware business in any part of the United States tomorrow.

And again, I would charge interest on all past due accounts. Let it be thirty days or let it be sixty days, but at the end of the time set, I would begin to charge interest. I would not only charge it but collect it. And right down in your heart some of you are thinking, "Well, you couldn't do it if you were running my store." That is just why you are not able to do it because you feel as you do. You acknowledge defeat before it is upon you. I can take you to many groups of hardware merchants in Wisconsin, as many as ten in a group who are all doing it, and with them it has been the salvation of their business, for it has enabled them to keep the profit which the sale carried, and which often was not any too large.

The handling of charge accounts is not a game for a man without a backbone. It takes business nerve to do it, and if you feel unable to develop the courage necessary to do a charge business on a sane and safe basis, then go on a cash basis, and for Heaven's sake, ***stay there.***

Let me illustrate why you can not afford not to charge interest. It is because it is a case of life and death to the retail business of the future.

Why in the future, and not in the past do you say?

Because your margins are going to be narrower. You are going to do well when you average more than 6 per cent net each year. I find several merchants that made from one to two per cent net this year. And some that made less. Let's speak of them in whispers and bow our heads in sympathy. It's not the gross you are concerned with but your *net*. Admitting that you have put a $100.00 account on your books, $6.00 out of the $100.00 is your *net profit*, providing you get paid for it. Let it remain on your books for a year. You sometimes do. In the meantime borrow $100.00 from the bank. Pay them $6.00 for the use of it. What is the sum total of the *net profit* that remains to you on this account —*zero*. And one day beyond the year it is less than nothing.

Why, I can not understand how any merchant can think of doing business without charging interest. Think it over. Study it from all angles. Dream of it. Talk it over with your wife, but by all means put it into effect as soon as possible.

This is a plea from a man who has been privileged to talk to 1,444 hardware men since January 1, 1921, about their troubles and who has consulted with them and in many instances tried to help them out of their difficulties, and I have found them to be mainly financial ones due to the large amounts of outstanding accounts which they are carrying.

So the first part of the solution of the present troubles of the hardware merchant is to adopt definite business terms which provide for shorter terms on all charge accounts, the encouraging of cash business and the charging of interest on all past due accounts.

The second is the wise selection of charge accounts. I will deal with it very briefly.

What would you do in the instance of the customer in whose home this conversation took place:

"John, what do you think, Mr. Brown has refused to give us any more credit."

"Well, my dear, perhaps we ought to give one of the other hardware men a chance."

Think back a moment. Have we, all of us, not once but often felt ourselves sort of puff up with pride as we noticed a customer of our competitors walk into our store and ask for certain merchandise, with the intent of buying? Oh, yes, we have.

Immediately we begin to pat ourselves on the back for the superior service we were rendering, and how the people would sooner or later find out what good merchants we were. And then the customer says to the clerk with an air of one conferring a favor, "Charge it." And the clerk hesitates and looks at you and the prospective patron of your store begins to fidget.

Then it's up to you. It is short notice, we know. But so it was short notice to Sammy, who was trying to steal into the house, after a harrowing experience with a mud puddle, and was met by his father in the hall.

"Well, sir," he inquired grimly, "where have you been?"

"I—I fell in a mud hole."

"What, in your new trousers?"

"Yes, sir, I didn't have time to take them off."

Neither did you have time to put your house in order and here is where you call into play your business nerve. What is "Business Nerve?"

It is the ability to refuse credit to a friend of your school days when he is not worthy. It is the courage to fire the old clerk who refuses to keep busy. It is the nerve that makes you hire a man just to keep the stock clean.

It is that which keeps your heart

beating steady as the village water works when a customer swears that he has spent his last dollar in your store, because you dared to ask for what was your own.

Are you going to be so glad to see this new customer at your store that you are going to forget to find out just why he comes to you now when he has always given Jones all the business, or will you question him and write down on a card, where he lives, what he is doing, how much credit he wants, when he will pay, who his references are and any other information you need to be able to judge sanely and surely if he is worthy of credit?

When you sometimes feel that you can afford to take chances, stop and analyze the loss of a bad account. Put it in the form of actual dollars and cents. Say to yourself, "My net profit on this sale is only about 5 per cent. Therefore, when I charge this $100.00, I will have to sell twenty times as much so as to make twenty times $5.00 profit or $100.00. Yes, I'll have to sell $200.00 more of merchandise like that to make up for the loss and then I won't have a single cent of profit on the transaction."

So I think we are agreed that you must go into the matter of getting information about credit applicants, just as thoroughly as the big department stores or the jobbers do, and that it is impossible to keep all this information in your head, and that it must be put down on cards or in other form convenient for reference in your office.

The "first aid" in collections is a definite understanding as to the terms of the sale. And when questioned as to what I meant, I made this statement before a large group of merchants, hardware men and others:

"Not one penny's worth of merchandise should ever leave your store to be charged unless the time of payment is understood by your customer."

I made no reservations or apologies for any customer good or bad. Your good customers is entitled to the same treatment as the doubtful one. He ought to know when the account should be paid. Why should you keep him in the dark?

You will have no difficulty in letting them know in a nice inoffensive way. First, you have decided on your "Definite Business Terms." Then You have made your announcement to the public by letters to individuals and through the newspapers and by card signs in your store. Your bill heads and sales slips carry this same information. And then a step further, the greatest you have ever taken if you have not used the plan before and that is the itemized monthly statement or "Bill of Monthly Purchases" which is a greatly superior name.

This will also introduce to your customers the fact that your bills are due at regular intervals and must be paid at that time.

Itemized bills rendered monthly would have prevented this.

Just a thought or two about what the bill should contain. We will assume you have adopted thirty-day terms. Then each monthly account will not show anything carried forward. It will show only the items purchased during the current month. Often I see statements where the printing on the first ruled line reads, *"Balance Forwarded."* You are so sure that there will be a *balance to forward* that you print it for convenience. Your customer will see it and begins to feel that there ought to be a *balance to forward,* so he sees that you are not disappointed and he pays you in part.

So to those of you who are using the Duplicate Invoice Ledger or the N. R. H. A. Customer's Ledger I would say that you find it a superior method to carry a general ledger page opposite your duplicate charge record the ledger page on the left and the itemized charge record on the right, and post to the ledger sheet each monthly total of the charges and crediting on it also the payments as made. Then each monthly bill will only show merchandise purchases and each bill should be paid just as you pay your invoices, and you never see a "balance forwarded" or any of your jobbers' invoices, do you?

But if you must show a previous month's account with the current month's purchases, make it read, "June account" or "June and July account," so he may immediately appreciate that he is behind in his payments and that this is no small balance of minor importance.

Monthly statements will keep several kinds of customers off your books—for instance, the man who gets mad twice, once when you ask him for the money, and again when he pays it. Then the small account of $1.00 and other nominal amounts will not remain unpaid. Also the good customer whom you hesitate to dun even when you need the money, will pay. He has learned to respect your progressiveness in adopting a uniform policy in regard to your credits, and will appreciate your monthly bills and pay them.

Then to the rendering of monthly bills, may be credited increase of available capital, lessening of interest paid at the bank, the possibility of taking discounts, the bringing of customers to your store more often, also as a medium of advertising as they reach your entire list every month and manufacturer's helps can be included in every envelope, and last of all the customers want them after they have once gotten used to them.

Wringer Prices Are Reduced About Ten Per Cent.

The new wholesale price list of Anchor Brand clothes wringers, dated August 21, 1922, issued by the Lovell Manufacturing Company, Erie, Pennsylvania, shows of reduction of prices amounting to about 10 per cent.

Sales of Anchor Brand clothes wringers for the first half of 1922 were 125 per cent ahead of the first half of 1921.

The best tonic for a sick business is advertising. Good advertising will pretty nearly resuscitate a dead business.

Suggestions and Plans for Window Displays.

Instructive Examples from Exhibits in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition.

REAPS BIG SALES FROM AUTO ACCESSORY TRIM.

One of the conveniences of a grocery store is that you can buy bread, butter, eggs, sugar, preserves, coffee, tea, cookies, and scores of other things in the same store.

Imagine what an inconvenience it would be to the shopper to be obliged to go to a different store for each one of these commodities.

When you come into a grocery store to buy coffee, you see many other things which you have not thought of purchasing when you started from the house and you buy them through the appeal of the goods themselves.

The same effect of association of ideas can be achieved in the hardware store.

As at present managed, the average hardware store is so stocked as to supply most of the things naturally grouped as hardware.

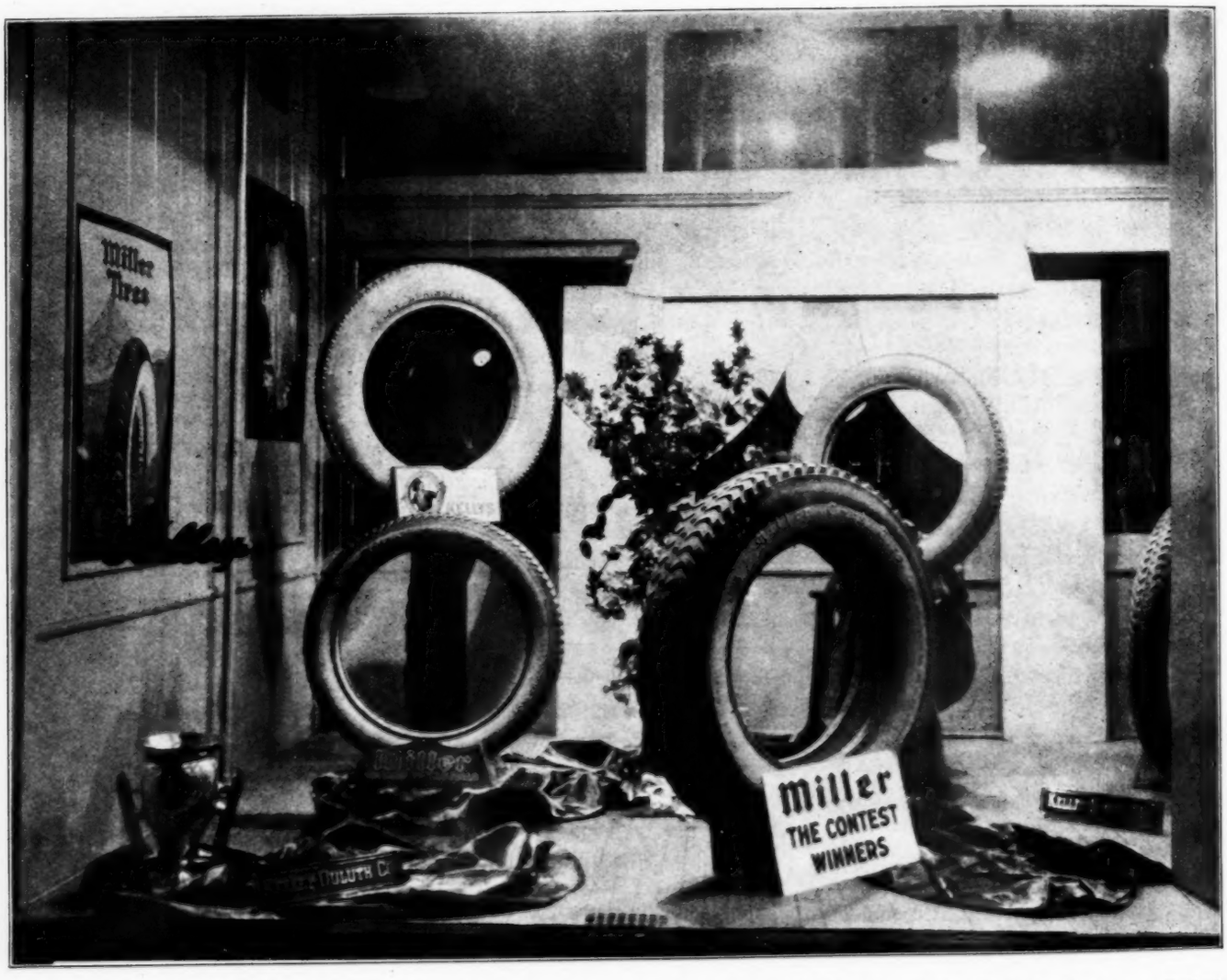
Picture to yourself the trouble it would be to go to a different store for nails, a different store for hammers, a different store for saws, etc.

The greater the variety of goods in steady demand which the hardware retailer carries in stock, the more thoroughly is he able to serve his customers and save them the inconvenience of promiscuous shopping.

This is one of the reasons why it pays to carry in stock automobile accessories which are in constant requirement by car owners.

There is a big profit in the sale of automobile accessories if properly presented to the trade.

An unusually effective way of doing this is shown in the accompanying photograph of a window display



Window Display of Automobile Accessories Designed and Arrranged by M. E. Klasky for Kelley-Duluth Company, Duluth, Minnesota.

of tires designed and arranged by M. E. Klasky for Kelley-Duluth Company, Duluth, Minnesota.

This window exhibit was put in during the automobile show in Duluth.

Therefore, it had the increased virtue of timeliness.

As briefly described by Mr. Klasky, "the background was painted blue and gold with blue velour on the floor.

"Gold wicker baskets to correspond to the color scheme of blue and gold were used to hold blue and yellow flowers, and this gave a touch of the unusual to the display.

"A nationally advertised and trade-marked brand of tires were shown in the window and this helped intensify the increase in buying during the exhibit.

"The results obtained," Mr. Klasky adds, "were very gratifying."

International Chamber of Commerce Will Meet in Rome, March 19 to 26 1923.

The second general meeting of the International Chamber of Commerce will be held in Rome, Italy, March 19 to 26, 1923.

The American Section of the International Chamber is desirous of creating a broader interest in international affairs and to this end invitations have been extended to chambers of commerce and trade organizations in the United States to participate in the Rome Meeting. Invitations have also been sent to a large number of business men throughout the country.

In line with the desire of the American Section to broaden interest in international affairs, plans have been made whereby those who attend the Rome Meeting may have an opportunity to study commercial and economic conditions in the Mediterranean countries, the Near East, and Western Europe.

The present indications are that there will be from two to three hundred American business men in attendance at this meeting.

It is planned to have the American delegation leave New York City on the Cunard steamer Cronia, February tenth, 1923.

All inquiries about the meeting and the trip should be addressed to Lacey C. Zapf, Secretary of the American Section of the International Chamber of Commerce, Mills' Building, Washington, D. C.

Proposed Tariff on Cutlery Is All Right. Proposed Tariff on Cutlery Is All Wrong.

Take Your Choice from Opinions of Manufacturers, Wholesalers and Retail Merchants.

THE United States Senate has passed a new Tariff Measure. So has the House of Representatives. They are far apart in particulars and in general application.

Therefore, a Conference Committee is now at work attempting to conciliate the differences and agree on a compromise, to be passed by both branches of Congress—if possible—before the election in November.

One of the important stocks in many hardware stores is that of cutlery, and as a great deal of imported cutlery is being sold in the United States, this class of merchandise has naturally come in for special attention in the consideration of the proposed Tariff Law.

It is, of course, impossible in a short article to give even an approximately comprehensive idea of the effect on prices which the proposed bill may have if the tariff rates set by the United States Senate are ratified and become part of the law, but one thing is evident—

That even among manufacturers, and even among those who for years have classed themselves as advocates of the protective principle in tariff legislation, there are many who feel that the proposed rates are too high and that they will act to exclude altogether every kind of foreign made cutlery, whether made in Germany, England or France.

All of us agree, we feel certain, that the higher standard upon which our workmen live makes it necessary that they should receive higher wages than their confreres in Europe, and a measure of protection is, therefore, necessary, in the shape of such a differential in tariff duties as will equalize the difference in production and distribution costs here and abroad.

On the other hand, there are many items of cutlery made in foreign countries which for some reason or other are not made here and which serve their purpose admirably.

To exclude these, by means of an exorbitant tariff, and thereby simply force the American consumer to buy an American piece of cutlery which does not serve his purpose any better but which costs him far more than the foreign made article, does not seem fair.

The statement has been made that if the proposed rates become enacted into law, the American cutlery manufacturers, as a class, will attempt to mulct the American consumer by charging all that the traffic will bear, although there may be instances of unduly high prices.

We quote from statements of prominent cutlery manufacturers wholesale and retail hardware merchants, as follows, and it will be noted that there is a wide divergence of opinion:

"We are in favor of a tariff which will amply protect the product of American factories, but we are very much opposed to the rates on cutlery in the proposed law, as they are without justification, excessive and prohibitive, thus giving a monopoly to the American manufacturer."—New York manufacturer.

"We believe that the proposed cutlery tariff will not result in preventing the importation of good German cutlery, but we hope that it will keep out the poor stuff that is not fit for use and a poor bargain at any price.

"In face of the keen competition among American cutlery manufacturers there can be no danger of profiteering. That is simply camouflage on the part of those who have been profiteering on imported cutlery and who wish to continue to do so."—New York manufacturer.

"Nearly 80 per cent of the production cost of cutlery is paid out for labor, and with the great difference in labor costs, it is necessary that we have a tariff which will equalize this difference. We do not believe that German cutlery will be excluded, but American manufacturers will be able to compete on a fairly even basis."—Connecticut manufacturer.

"The proposed cutlery tariff is prohibitive—nothing less or more." —Southern hardware jobber.

"If this new tariff becomes a law, the American public will have an unfair burden to bear."—Another Southern hardware jobber.

"We do not believe that the American cutlery manufacturer needs the amount of 'protection' afforded by this proposed tariff."—Western hardware jobber.

"There is a feeling among retail hardware merchants that American cutlery manufacturers were, and are, among our worst profiteers. While I am in sympathy with the principle of protection for our industries that need such protection, I do not feel that 'protection' should amount to three times the cost of imported goods laid down in New York."—Minnesota retail hardware merchant.

"I think that the present tariff—not the one proposed—is high enough to furnish all the necessary protection for the American manufacturer."—Illinois retail hardware merchant.

"We should consider any tariff providing for higher rates than those prevailing previous to the war as excessive."—Massachusetts retail hardware merchant.

"I would not want to see the cutlery tariff rates so high that they would keep foreign manufacturers out of the American market."—Iowa retail hardware merchant.

"If we permit foreign manufacturers to fill the shelves of our stores we, thereby, reduce the purchasing power of our public. American manufacturers have never, so far as I know, asked for more than a tariff that will give them a chance to earn a fair return on their investment."—Wisconsin retail hardware merchant.

Chalmers M. King, Old Guard, Passes Away.

One day before his seventy-fifth birthday, Chalmers M. King, President of the Old Guard Southern Hardware Salesmen during 1916-1917, passed away on Thursday, August tenth, at his old home, near Saint Clairsville, Ohio.

Mr. King was for many years in the Internal Revenue Service of the Federal Government, but about twenty-five years ago became connected with the McKinney Manufacturing Company, and represented this Company with the wholesale trade; while he has sold builders' hardware to jobbers in all parts of the country, Mr. King was probably best known in the Southern states and became a member of the "Old Guard" in 1911, occupying several offices in that organization, culminating in his election to the presidency in 1916.

Mr. King was not married. He leaves two brothers who with his many firm friends mourn his loss.

One by one the old timers pass on, but as they do, they leave their imprint on the pages of Hardware History, and we know that the page devoted to the record of Chalmers M. King is one of which he and his friends may well be proud.

Chalmers M. King.

Gross Department Manager, John H. Seifert, Passes On.

John S. Seifert, associated with the Philip Gross and Sons Hardware Company, Milwaukee, Wisconsin, for 33 years, died August 18th at his home, 415 Kenwood boulevard, Milwaukee, at the age of 51 years. He was a thirty-second degree Mason, past president of the Travelers' Protective association and a member of the Merkel Fishing and Hunting club.

Mr. Seifert started to work for the Gross store as an errand boy and at the time of his death was sales manager of the machinists' supplies department.

Mr. Seifert is survived by his widow, one daughter, Annette, and his father, Joseph Seifert. Funeral

services under auspices of Henry L. Palmer Masonic lodge held Monday, August 21st, at 2:30 p. m., with burial in Forest Home Cemetery.

Hardware Firm Uses Unique Method to Find Best Location.

The McKinley Hardware Company, Rock Island, Illinois, has been considering a change of location for its business and took a clever way to ascertain what street would be most suitable.

A "Mystery Man" was employed. He asked pedestrians a lot of questions, and nobody seemed to know what he was about, but it finally turned out that the information which he sought was simply which street was most frequented by pedestrians.

While the method is not entirely new, having been used by the United Cigar Stores Company for several years in selecting locations for new stores, the McKinley Hardware Company improved on it by adding the element of mystery, thus securing considerable newspaper publicity and causing much talk among the citizens of Rock Island, all of which drew attention to its store.

What Do You Know About Your Business?

Pertinent queries about your business are contained in a quiz sheet prepared by the Chamber of Commerce of the United States America. Look over the following questions. Check yourself up on these points and see how nearly 100 per cent you measure.

1. Do you keep a "purchase account" that shows total of all goods bought?
2. Do you know what you save annually by discounting bills?
3. Do you know what it costs to buy goods?
4. Do you know what you owe?
5. How often do you take stock?
6. Do you figure stock at cost or selling price?
7. Do you make allowances for depreciation and dead stock?
8. Do you make depreciation of fixture and delivery equipment.?
9. Do you know what is due you?
10. Can you furnish your bank a financial statement at once?
11. Are collections made as rapidly as accounts increase?
12. Do you know what it is costing you for allowances for customers?
13. How often do you make up a "Profit and Loss Account?
14. Into how many separate accounts are your expenses divided?
15. Do you own the building in which you do business?

Coming Conventions

National Hardware Association Marlborough-Blenheim Hotel, Atlantic City, New Jersey, October 17, 18, 19, and 20, 1922. T. James Fernley, secretary-treasurer, 505 Arch Street, Philadelphia, Pennsylvania.

American Hardware Manufacturers' Association, Marlborough-Blenheim Hotel, Atlantic City, New Jersey, October 18, 19 and 20, 1922. F. D. Mitchell, secretary-treasurer, 1819 Broadway, New York City.

Western Implement, Vehicle and Hardware Association, Kansas City, Missouri, January 16, 17, 18 and 19, 1923. H. J. Hodge, Secretary, Abilene, Kansas.

Texas Hardware and Implement Association, Dallas, Texas, January 23, 24 and 25, 1923. A. M. Cox, Secretary, 822 Dallas County Bank Building, Dallas, Texas.

West Virginia Hardware Association Convention and Exhibition, Huntington, West Virginia, January 30 and 31, and February 1, 1923. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Indiana Retail Hardware Association Convention and Exhibition, Indianapolis, Indiana, January 30 and February 1 and 2, 1923. G. F. Sheely, Secretary, Argos, Indiana.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, February 6, 7, 8, 9, 1923. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

Wisconsin Retail Hardware Association, Milwaukee Auditorium, Milwaukee, Wisconsin, February 7, 8 and 9, 1923. P. J. Jacobs, Secretary-Treasurer, Stevens Point, Wisconsin.

Pennsylvania and Atlantic Seaboard Hardware Association Convention and Exhibition, Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14, 15 and 16, 1923. Sharon E. Jones, Secretary, 1314 Fulton Building, Pittsburgh, Pennsylvania.

Ohio Hardware Association Convention and Exhibition, Cleveland, Ohio, February 13, 14, 15 and 16, 1923. Exhibition in the new Municipal Hall. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Illinois Retail Hardware Association Convention and Exhibition, Hotel Sherman, Chicago, Illinois, February 13, 14 and 15, 1923. L. D. Nish, Secretary-Treasurer, Elgin, Illinois.

Iowa Retail Hardware Association Convention and Exhibition, Des Moines, Iowa, February 13, 14, 15 and 16, 1923. A. R. Sale, Secretary, Mason City, Iowa.

New England Hardware Dealers' Association Convention and Exhibition, Mechanics' Building, Boston, Massachusetts, February 21, 22 and 23, 1923. George A. Fiel, Secretary, 10 High Street, Boston, Massachusetts.

New York State Retail Hardware Association Convention and Exposition, Rochester, New York, February 20, 21, 22 and 23, 1923. Headquarters, Powers Hotel. Sessions and Exposition at Exposition Park. John B. Foley, Secretary, City Bank Building, Syracuse, New York.

Retail Hardware Doings

Illinois.

The Gillespie Hardware Company, Gillespie, have moved their stock to the south room in the Westwood Block.

August Rosander and Gust and Abel Erickson are the incorporators of the Seventh Street Hardware Company which has been opened at 208 Seventh Street, Rockford.

Missouri.

W. N. and R. H. Rucker have purchased the Robert Willis hardware stock at Comanche.

North Dakota.

The hardware store of J. L. Berg at Aneta has been destroyed by fire.

South Dakota.

Joseph F. Dvorak of Kaylor has closed his hardware store at Avon and moved the stock to Kaylor, consolidating it with the stock of the D. and B. Hardware Company.

Ohio.

The Grimes Lock and Hardware Company of Cleveland has been incorporated with a capital of $15,000. Incorporators are: Albert E. Rodell, Grant C. Shealy, Edward T. Grimes, Henry D. Grimes, and Allen A. Amstutz.

Texas.

Cavitt-Lee Company of McGregor has increased its capital stock, and has changed its name to Lee Hardware Company.

The Carpenter Hardware Company of Cleburne has been sold and moved to the former H. S. Wilson Hardware Company location. The new business will be known as the Johnson County Hardware Company, with Mr. Bowers as manager.

The Western Hardware Company, 406 Polk Street, Amarillo, has been sold by F. A. Parks and associates to J. C. Dickie. The firm name will be changed to J. C. Dickie Hardware Company.

Wisconsin.

The stock of Elkhorn Hardware Company of Elkhorn has been damaged by fire.

Oluf Norland and Sam Sorenson, for many years employees of the Daylight Hardware Company, Stoughton, have purchased an interest in the firm from Mrs. George H. Thompson.

Frank Leuschen has engaged in the hardware business at Phillips as a member of the Baumann-Leuschen Hardware Company.

Study and Interpretation of Advertisements.

You Can Make Your Advertisements More Gainful by Avoiding the Faults and Profiting by the Good Qualities of Others.

There is a distinctly human and friendly element in all the advertisements of the Rechlin Hardware Company.

Rechlin's "People who live in glass houses shouldn't make booze." Rechlin's
TOPICS FROM RECHLIN'S:—
Can you imagine anything better than a day or week's outing in the open with your family? Whether you camp out for a day or a week, we can equip you with a complete camping outfit, consisting of
Folding Camp Chairs and Cots
We Also Have a Complete Line of
CAMP STOVES, CAMP GRIDS AND UTENSILS
Look Over These Specials Carefully
FOLDING CAMP CHAIRS
Made of selected wood canvas seat, fine workmanship.
49c
FOLDING CAMP GRIDS
With wind shield made of heavy wire, electrically welded. Large size.
$1.98
RECHLIN HARDWARE CO.
HARDWARE-FURNITURE-FARM IMPLEMENTS
Fifth and Washington — "The Name of the Firm Guarantees the Quality of the Goods" — Third and Johnson

Here is one of the firm's advertisements reproduced from the *Bay City Tribune,* Bay City, Michigan.

It will be noted that at the top of the advertisement there is a bit of humorous philosophy which puts the reader in good spirits.

Times change and proverbs need to be modified accordingly.

Hence, the appropriateness of this first line, "People who live in glass houses shouldn't make booze."

Note the pleasant introduction to the advertisement of folding camp chairs and cots.

The appeal is direct from the first word.

The imagination is stirred by the suggestion of the delight of a day's or a week's outing in the open.

Logically comes the statement that Rechlin's can equip the prospective customer with a complete camping outfit.

An idea of the reasonableness of the prices is given the reader by two quotations, namely, 49 cents for folding camp chairs, and $1.98 for folding camp grids.

The descriptive text of this advertisement is very brief but comprehensive.

* * *

Cool autumn days are approaching when children resume the healthful sport of roller skating.

Hence, it is timely to advertise roller skates.

A good example of this kind of advertising is shown in the illustration reproduced herewith from the *Council Bluffs Nonpareil,* Council Bluffs, Iowa.

The text of this advertisement is brief, but well composed.

Everything needed to describe the construction and advantages of the roller skates offered for sale by De Vol's is contained in a few words.

"Ball-bearing roller skates with ball-bearing wheels and extension truss frames" constitute desirable features of this commodity.

There is an indirect advantage in advertisements of this sort.

By catering to the trade of the boys and girls, the hardware dealer is building for the future, as well as gaining profit in the present.

The boy who buys roller skates today is likely to be the carpenter or machinist who buys tools tomorrow.

The girl who has derived pleasure and long service from the roller skates does not easily forget the sturdiness of the roller skates and the pleasing courtesy of the people that sold them to her.

ROLLER SKATES
Ball-Bearing, Extension Roller Skates
FOR BOYS
FOR GIRLS
NOW ON SALE—$1.98
High Grade, Ball Bearing Roller Skates, With Ball Retaining Wheels and Extension Truss Frames.
504 Broadway
De Vol's HARDWARE
10 North Main St.

Facts of Warm Air Heating and Ventilating.

Reports of Progress in Warm Air Heater Research Work. Ventilating Factories, Theatres and Other Buildings.

Detroit Passes Ordinance to Regulate House Heating.

An ordinance regulating the installation of heating systems in dwellings has been passed by the city of Detroit, Michigan.

This ordinance, which was prepared largely through the efforts of J. C. McCabe, formerly chief boiler inspector and now research engineer for the city, was finally passed on by the city council on July 6.

The average practice in most cities is to give some attention to the heating equipment in apartment buildings and perhaps large dwellings, down to 1,200 sq. ft. of steam radiation.

The new Detroit ordinance goes a step farther in that no limitations are placed as to the size of the equipment.

The ordinance requires that any person installing a heating system in dwellings must have a contractors' license from the Department of Buildings and Safety Engineering and as a surety that the rules will be observed, he is required to file a bond in the sum of $1,000.

No installations can be made without a permit and the application blank calls for information that will give full published records of the number of rooms, general dimensions and type of construction.

The published rated capacity of the various types and sizes of apparatus, whether boilers for steam or water or warm-air furnaces, must also be given to the department.

It is stipulated that the heating installation shall have a capacity to maintain a temperature of 70 degrees, Fahrenheit in the main living room and a temperature of 65 degrees, Fahrenheit, in sleeping apartments or kitchens in which registers or radiators are placed, and that this internal temperature shall be possible of maintenance while outdoor air is at 0 degree, Fahrenheit, provided a suitable chimney flue is furnished and all doors, windows and the dwellings are reasonably constructed.

Rules for the installation of the heating equipment are to be formulated by the board of rules and five representatives of contractors' installing heating equipment, these rules and regulations to become effective when approved by the common council.

None of the rules is to apply to the design of systems or apparatus.

In the ordinance a number of other details are included such as stipulating the periods during which inspections will be made, the charging of a maximum fee of $2.00 for each permit; the exclusion of hotels, club houses, hospitals, and other public buildings and the fine imposed for violation of the ordinance.

Dougherty Suggests Good Method for Finding the Real Heat Loss in Building.

Part of Paper P. J. Dougherty, Chairman Research Committee of the National Warm Air Heating and Ventilating Association.

HEAT loss and the line sizes, those are two things regarding which I am going to throw out a little food for thought, just as a suggestion for the committee that is working on the rating proposition. As to the article I wrote on that, after talking with the Research Committee of the National Warm Air Heating and Ventilating Association, I decided it was really premature, although two principles may be given out for thought, but the other formula for ratings, and so on, I think had better go over for more thorough consideration by our Research Committee.

We want to establish a heat loss rule. There are two things that we must keep in mind. We must make that rule just as simple as the Lord will allow us. Simplicity is one of the most important things for a rule, but it is just as essential that the rule be founded on bed rock. You must get down to bed rock. We have had enough of superstructure building. We must get down to a heat unit basis. That rule must be based on a heat unit basis first, last and all the time. That can be very easily shown without bringing in the heat unit question at all. How? Here is my abbreviation of my figuring for heat unit; a "u" and an "h." We are all accumstomed to the Roman "M" that represents a thousand. That is something that we should, in my opinion, come to. After my work with the American Society of Heating and Ventilating Engineers and the American Society of Mechanical Engineers, I know that is the drift of thought; that is, getting down to a thousand heat unit basis, not only for simplification of figuring, but also getting back to the metric system. The engineer of today is drifting closer and closer to the metric method of calculation because our English method of calculation is very crude and very unscientific. A thousand heat units is going to be the central thought that I want to put across here today.

How are you going to figure heat loss? There are three factors that must be considered. First, cubic contents; second, the square foot of wall and, last, the square foot of glass. The first is in cubic feet, the second is in square feet and the third is in square feet.

The second is that we have certain factors determined by good

practice along low pressure heating lines and we should take advantage of that experience.

To raise a cubic foot of air from ten above to seventy-two above requires one and twenty-five one-hundredths heat units.

I recently attended a meeting of the New York Chapter of Heating and Ventilating Engineers, where I listened to a very interesting discussion on how to heat a little home, delivered by the Chairman of the Standardization Committee of the Piping Contractors' Association. He gave us some very good ideas of what his committee is doing, and he made this statement, which is very, very true: The air change factor when you get down ten below zero, and you have very slight wind and your air change factor, from ten to fifteen above with a wind, is no more troublesome than it is at ten below, so if you can heat at ten above with a wind, as a rule, there is no trouble at all below that. Multiply one and twenty-five one-hundredths heat units by two and that gives you two and five-tenths heat units for every cubic foot in the room. The question is, what factor connects that up with a thousand. Four hundred. Multiply two and five-tenths by four hundred and you get a thousand heat units. What does that mean? For every four hundred cubic feet of space in that room, if four hundred cubic feet in that space represents a value of one thousand heat units, then you have eight hundred cubic feet in the room, and you would have eight hundred divided by four, or two of those basic units. If you had two thousand cubic feet in a room, which would be an ordinary fourteen by sixteen room, see how simple it is—merely cross off the last two ciphers. See the simplicity of the rule. If you want to find the cubic contents, merely cut off the last two figures of the contents, divide by four, and you have the number of basic units required in thousands of heat units.

Now the wall. Twenty-two is our factor for steam for one degree per square foot and fourteen our co-efficient. Seventy times that would be—twenty-two heat units raising from zero up to seventy in good frame construction. However, I take seventy-five because you don't always get good frame construction and that is only a little over ten per cent above the general steam practice. How many square feet of wall will produce this unit? Multiply that by forty and you have a thousand, have you not? In this room, two thousand cubic feet of cubic contents there would be approximately two hundred feet of wall, less glass, divide that by forty and what have you? You have a heat loss represented by five, based on good standard practice, twenty-five heat units to offset the heat loss, zero outside, seventy inside.

For glass, take the factor eighty-three and that is the factor, eighty-three heats units per square foot of glass, that the Standardization Committee of the Piping Contractors' Association has decided upon, and one and two-tenths is the co-efficient, seventy times that is eighty-four, so you can see it is lining up with the best practice followed in the Heating and Piping Contractors' Association, and I might say that every member of the Heating and Piping Association Committee on Standardization are also very active and live men in the American Society of Heating and Ventilating Engineers. How many square feet of glass then will be required to make a thousand? If you divide one thousand by eighty-three, you have twelve, approximately. For every twelve square feet of glass you would have a heat loss of one thousand heat units. So, by dividing your square feet of glass by twelve you get your heat loss from the glass.

Let's put values in here. Suppose you take two thousand cubic feet in this room fourteen by sixteen, divide that by four hundred, and suppose you take the wall of the same room, say it is two hundred square feet of wall after you deduct the openings, divide that by forty, that will give you the basic heat units, and you have three windows, sixteen square feet each, which is an average window; that is forty-eight; divide that by twelve.

See the simple method of calculation you have here. Four hundred into two thousand equals five; forty into two hundred equals five; twelve into forty-eight equals four. What have you? That room represents fourteen thousand heat units that is lost in that room.

You can readily see, in the first place, that rule is established absolutely on the basic practice, on the best practice of the leading engineers today in the United States in steam and hot water work, and they are working exactly in the same field as we furnace men.

So, divide the contents by four hundred, divide the square feet of wall by forty, and divide your glass by twelve and then reduce it down to a heat unit loss on the basis of one thousand, and you have fourteen thousand heat unit loss that room would have. Four by fourteen is fifty-six, direct steam radiation—I can always think in radiation much more quickly than I can in square inches of leader pipe, because I have been used to it. So, in an ordinary living room, fifty-six square feet of radiation is standard practice. That is one rule that I would throw out to this committee. I center everything around a thousand heat units.

That rule has already been adopted by the Piping Contractors' Association, and it is only a matter of time until it will be adopted by the American Society of Heating and Ventilating Engineers, and the Furnace Manufacturers' Association.

New Rudy Catalog Is Both Artistic and Helpful.

A welcoming glow, throwing its red message across the snow covered sidewalks and inviting to warmth, solace and comfort, is the first impression produced by the beautifully illustrated cover of the new catalog of the Rudy Furnace Company, Dowagiac, Michigan.

Art is made to serve business in

a delightful manner in the make-up and illustration of this unusual catalog.

Practically everything that a prospective buyer of warm air heater would want to know is told him in connection with Rudy furnace in the pages of this catalog.

It contains no puzzling technicalities.

The various features of the "Rudy Diving Flue Hy-Power Warm Air Furnace" are set forth in a double page of diagram, illustration, and text.

By means of this catalog, the Rudy dealer is enabled to increase the volume of his sales, as it constitutes a very persuasive factor of solicitation.

Evaporation of Small Amounts of Water Is Not Real Humidification.

Professor Kratz Discusses Results of Three Years' Test of Humidifying Appliances on Warm Air Furnaces.

IN A VERY interesting and instructive paper read before the National Warm Air Heating and Ventilating Association by Professor A. P. Kratz, who for several years has assisted Professor A. C. Willard in the research work being carried on at Illinois University under the auspices of the Association many important facts were brought out, and we are glad to give the fullest possible publicity to the statements of Professor Kratz, whose paper follows:

Humidity may be defined as the water vapor mixed with the air. In general this humidity is in the form of saturated or superheated steam at practically atmospheric pressure, and does not consist of suspended particles of water floating in the air. The latter condition gives rise to fog or rain.

The maximum weight of vapor that any given space can contain depends upon the temperature within the space. If the temperature is slightly lowered, some of the vapor will condense. Under these conditions the space is said to be saturated with water vapor. If the space does not contain the maximum weight of water vapor that is possible at the given temperature, then it will be found possible to lower the temperature without condensation taking place. If this is done, a temperature will finally be reached at which condensation begins to appear. This temperature is called the dew point. On the other hand, if a space is saturated at a given temperature and the temperature is raised, then the space will no longer contain the maximum possible weight of water vapor. Under these conditions, if water is introduced into the space it will evaporate rapidly at first, but much more slowly as saturation is approached. The presence of air in the space at the same time as the water vapor does not change any of the conditions discussed, and the air is said to be saturated when the space containing the air and water vapor is saturated, or when it contains the maximum weight of water vapor possible at that temperature. If the air is not saturated, the ratio of the weight of water vapor actually contained in a given volume to the weight that it could contain at the same temperature is called the relative humidity.

An understanding of the principles which have just been discussed is necessary for a clear conception of the functions of humidity in furnace heating, and for an understanding of what changes occur in the humidity when the air is heated.

Functions of Humidity.

If the air in a room is not saturated, evaporation will take place. The rate at which the evaporation takes place, as previously indicated, depends upon how far the air is from the saturation point, or in other words, upon how low the relative humidity is. Since heated rooms are used primarily for human habitation, the functions of humidity must necessarily be considered mainly from the standpoint of its effect on the human body. The chief effect of low humidity is to cause rapid evaporation from the skin and from the membranes in the mouth, throat and lungs. The evaporation from the respiratory tract throws an extra load on these membranes and lowers the vitality, thus increasing the susceptibility to colds.

The relative humidity in the outdoor air averages from 60 to 70 per cent, and this seems to be about the condition for which the human mechanism is adjusted to insure the maximum comfort. With this humidity a temperature of from 65 to 70 degrees Fahrenheit is comfortable. The work of Dr. E. Vernon Hill seems to have established a fairly definite "comfort zone" between a relative humidity of 36 per cent at 70 degrees and a relative humidity of 50 per cent at 66 degrees. Below 36 per cent the evaporation from the skin produces a cooling effect, lowering the surface temperature and thus causing the body to feel colder than the temperature indicated by a thermometer in the room. The chief function of humidity may, therefore, be said to be to exercise a proper control on the evaporation from the human body so that a reasonable degree of comfort may be maintained without the use of excessively high temperatures.

Humidity Requirements.

It has been previously indicated that when a change in temperature of air containing a given weight of water vapor takes place, a change in relative humidity also occurs. Thus, if cold air from outdoors is heated without the addition of more vapor, since the weight of vapor required for saturation at the higher temperature is much greater than that required at the lower temperature, and the actual weight of vapor present remains fixed, the relative humidity will be decreased for the heated air. Also when warm air with a fairly high relative humidity comes into contact with cold sur-

faces, such as window panes, it is cooled below the dew point and moisture is deposited on the surfaces. It has been found that for single windows, if the numerical value of the per cent relative humidity is much higher than the mean between the indoor and the outdoor temperature, the condensation becomes excessive. For 70 degrees inside and zero degree outside, the mean value 35 also corresponds very well with the relative humidity required for comfort at 70 degree. Thirty-five per cent relative humidity is, therefore, considered as the most practical value for residences.

The water required to produce 35 per cent relative humidity in an average residence may be obtained as follows: Assume a residence of 30 feet x 30 feet to be maintained at 70 degrees in zero weather. Average relative humidity outdoors 60 per cent. Air inleakage 1½ changes per hour. Total volume of the heated portion of the house=30×30×18=16,200 cubic feet.

Total volume of air leaking in per hour=16,200×1.5=24,300 cubic feet.

If the air density is 0.0735, then the weight of air leaking in per hour = 24,300 × 0.0735 = 1,785 pounds.

The difference between the water vapor in this air leaking into the house, and the water vapor it must contain at a relative humidity of 35 per cent at temperature of 70 degrees, represents the water vapor that must be added.

At zero degrees the weight of water vapor present in one pound of air at 60 per cent relative humidity is 0.00047 pounds. At 70 degrees, the water vapor present at 35 per cent relative humidity is 0.00552 pounds.

Therefore, the weight of water vapor required to be added to each pound of air is 0.00552—0.00047=0.00505 pounds.

The total water required per 24 hours is, therefore, 24×1785×0.00505=216 pounds or 26 gallons.

From the preceding calculation it may easily be seen that it is useless to expect to humidify by means of water pans evaporating small amounts of water.

Tests of Water Pans.

Tests of several types of water pans were started by W. E. Pratt, special investigator and research associate in the Engineering Experiment Station at the University of Illinois in the summer of 1919 as a part of the program of Warm-Air Furnace Research, this work has been carried on and a preliminary report was made at the Annual Meeting of the American Society of Heating and Ventilating Engineers in January, 1922, and appears in the Journal of that date. The preliminary tests were run on the furnace installed as a part of the experimental heating plant in the Mechanical Engineering Laboratory at the University of Illinois. This plant will be designated as furnace Number 1.

The object in view in the preliminary tests was the determination of the evaporation rate of three different types of water pans for various rates of combustion, and also the effect of the location of the pan upon the evaporation rate.

The crescent shaped pan used for the preliminary tests was then removed from furnace Number 1 and installed in a furnace in a private residence, in order to study its action under service conditions and to obtain data relative to the weight of water required to produce the humidity necessary for the maximum degree of comfort. This furnace will be designated as furnace Number 2.

Owing to the withdrawal of Mr. Pratt from the research staff, it became necessary to install a crescent-shaped water pan in a furnace at another residence in order to continue the work. This furnace will, therefore, be designated as furnace Number 3. The work was continued along the same lines as before, with the additional object in view of determining whether a change in humidity would affect the amount of coal required to heat the house.

(To Be Continued)

Laws That Apply to Heating of School Houses.

The laws in various states cover carefully certain points which must be embodied in the installation of a heating or ventilating system in school houses.

First. They call for 18 square feet of floor area per pupil.

Second. Not less than 200 cubic feet in room per occupant.

Third. Glass area to be all on one side, and not less than 20 per cent of the floor area.

Fourth. Ceilings not less than 12 feet in height.

Fifth. Ventilation must be provided to the extent of supplying 30 cubic feet of air per minute per occupant.

This calls for the carrying into the School Room of about three times as much air as would be necessary were the air to act only as a heat carrier with power enough to offset the normal heat losses in the room. This being true, the air, instead of coming into the room in the neighborhood of 130 degrees, or about 60 degrees above room temperature, it would have to be brought into the room at a temperature of about 90 degrees, or only 20 degrees above room temperature—the greater volume at a lower temperature on account of the legal requirement, instead of the average temperature which would be maintained aside from a legal requirement.

To accomplish this, namely, to bring three times as much air in as would ordinarily be required where no ventilation was figured, and to bring it in at an average of 90 degrees instead of 130, the heater would be called upon to generate almost twice as much heat as where no provisions for ventilation are made. Therefore, a heater having twice the capacity should be selected.—*Torrid Zone Manual of Warm Air Heating.*

Before doing bigger advertising, see whether you can perhaps do better advertising of the sort you are already engaged in.

Practical Helps and Patterns for the Tinsmith.

Aids to the Improvement of Craftsmanship and Business. News from Various Branches of the Sheet Metal Trade.

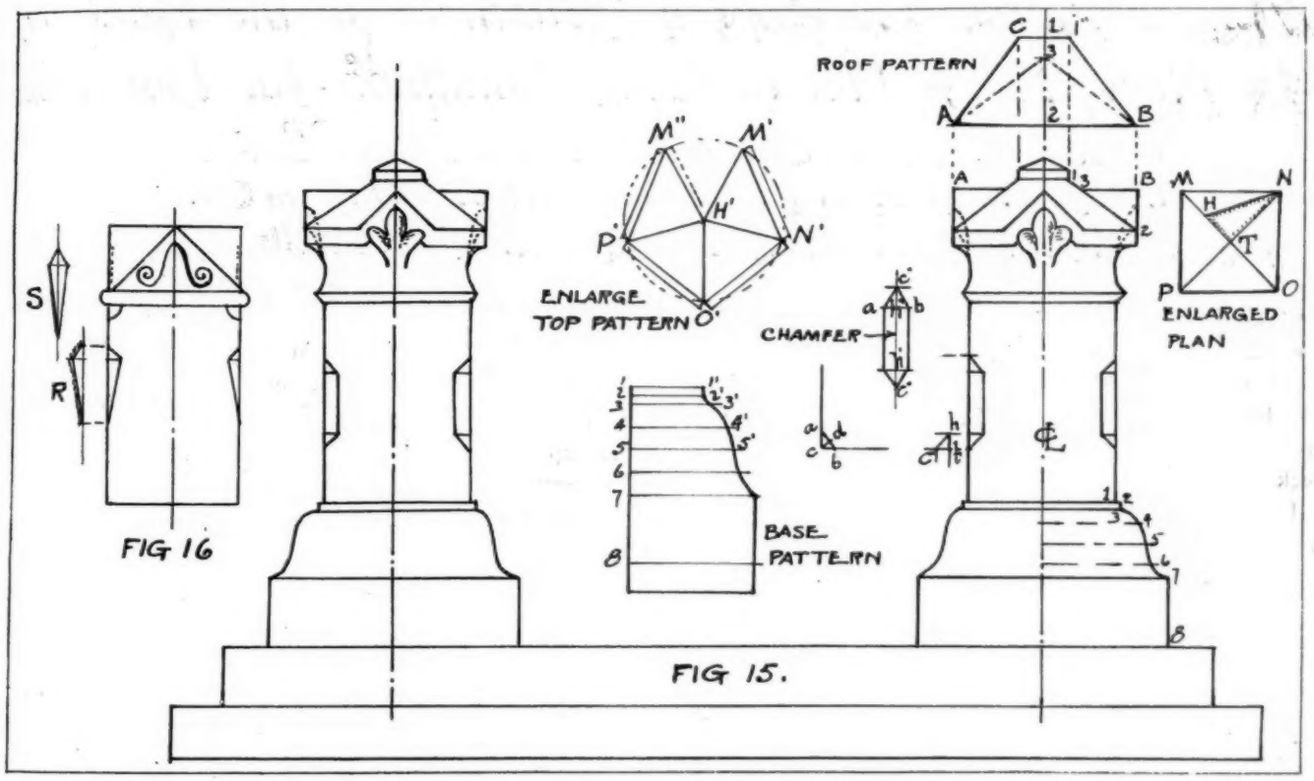
DESIGNS AND PATTERNS FOR GATE WAY POSTS.

By O. W. Kothe, Principal, St. Louis Technical Institute, St. Louis, Missouri. Written especially for American Artisan and Hardware Record.

Many people prefer quite elaborate tomb designs and arrangements, even going to vast expenses. as long as they are in proportion and designed for their purpose.

Manufacturing shops who intend to follow up this product, should make a careful study on the meaning of tombs and what the different features stand for or represent.

As for instance, there are gateways and even chairs provided near the tombs to typify physical places



Designs and Patterns for Gate Way Posts.

equal spaces, especially the base, and pick the girth and set it off as at 1-8 in pattern for base.

Then pick the half widths from center line and set them off on similar stretchout line as at 1′-2′-3′, etc.

To set out the chamfer placed in the body of the post, a part sectional view as a-c-b is necessary, placing

For such people, who have unlimited means, most any sort of design can be worked out that leaves the impression of enduring forever.

But for less pretentious designs details can be worked out so that a very tasty arrangement is provided at a considerable less cost, although be durable as well.

So, in figure 15, we have some corner posts and the platform generally used when providing a gate way to the tomb.

Many designs can be worked out and all of them will be serviceable for disembodied spirits to rest and to come and go.

Whether there is anything to these fantastic delusions or not, we must leave that to the public who believe in them and who do not believe.

To lay out the patterns for a design as in number 15, first detail in the post from the center line, sketching in the one side, and then drawing lines and lifting the half widths over, so as to get the other side equal to the first half side.

Then divide all curved lines in line a-b on a 45 degree angle and this line will be the true width of the chamfer.

For the upper and lower corners a true length must be developed.

So, we pick the altitude h-t from elevation and on the base set the projection of section c-d and set as t-c′; then c′-h will be the true length for the corner.

Next set out the pattern making the width as a-b and the height h′-h″ and then add the length h-c′ and set as h′-c″ and h″-c″.

Then join these points with lines

and you have the pattern for chamfer.

The main roof is developed by picking the girth as 1-2 from elevation and setting it as 1-2 in pattern.

Then draw stretchout lines and from the points in elevation erect lines to intersect those in pattern as A-B and C-1".

Join these points with lines and you have the pattern.

And to set in the lines for the small gable pick the length 2-3 from elevation and set as 2-3 in pattern.

From 3 draw a line to A and B as shown by the dotted position which shows the line on which the gable roof must miter.

To set out the pattern for the cover, which is a square cap with a slight raise, our plant shows an enlarged view of it as M-N-O-P.

Let H-T be the rise and H-N will be the radius to describe the arc in pattern.

Pick the side lines from plan and step them off on this arc as M'-N'-O'-P'-M".

Join these points with lines by cutting off the segments of the arc and draw hip lines to H'; add edges and the pattern for top is finished.

A similar design, only more simple, can be worked out as in figure 16, where the chamfer is tapering.

At R we have the section and at S is the pattern.

Where these fittings are made of copper or brass and the joints soldered, then a sufficient lap must be made where no other joint is convenient, so rivets can be placed at close intervals and the heads be countersunk on the outside.

When a Fellow Develops a Carbuncle on the Back of His Neck, He Is Not in Good Condition for Business.

Occasionally, a Local Sheet Metal Association Gets a Carbuncle through Thoughtless Neglect on the Part of Some of Its Members.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by J. C. Greenberg, Cleveland, Ohio.

BILL WARD was feeling pretty bad when I saw him last. He could hardly be blamed for feeling bad because he had a well developed carbuncle on the back of his neck.

If I tried to crack a joke he would complain that he could not laugh on account of that dern carbuncle.

If I said something sad, he would say that he had troubles enough of his own—and he sure had.

If I kept still, he'd listen to that old carbuncle till the back of my own neck began to ache.

I simply had to say something, so I tried to say something that was neither funny nor sad. So I began to talk about the beautiful spring weather.

This got Bill sore because every spring brings lilacs and carbuncles to Bill.

Were you ever in a fix like that?

I wanted to talk to Bill to cheer him up, but there seemed nothing that would cheer him. Finally, I remembered that old saying that misery loves company, so I tried to be just company, and let Bill choose his own topic.

"Gee!" Bill exclaimed, putting his hand over that carbuncle, "I just wonder why there are carbuncles. Here I am up to my neck in work, but this dern thing keeps me awake nights, and won't let me work daytime."

"Yes," I replied. "Those carbuncles are bad things. They sure put a fellow out of commission."

"Did you ever have one?" Bill asked.

"No, I never did," I admitted.

"Well, then, whattahell're you talking about it for! I thought you had some experience in this here thing," Bill said, getting sore. I leave it to you, dear reader. What could I say? I was in a tender predicament, and to get out of it I just had to laugh.

"There is nothing to get sore about, Bill," I replied, consolingly. "I did not hand you that carbuncle. I merely came to cheer you up because you are sick. I feel sorry for you, all right."

"Excuse me, old pal," Bill answered sorrowfully, " a fellow is not himself when he is in a fix like that. But just what does make a carbuncle?"

At first I thought that Bill was getting batty, but he really was serious, so I tried to explain. Not that I knew anything about how to make a carbuncle, but rather because Bill chose something that he was interested in.

"You see, Bill," I began to explain, "the blood in the human system is composed of red and white corpuscles which circulate through the system by the force of the heart beats. This blood circulation feeds the body cells and——"

"Hold on a minute!" Bill exclaimed, "what has that cell and circulation stuff got to do with a carbuncle, anyway?"

"I was just getting to that, Bill, when you interrupted me," I said. "These cells in the body make other cells and these other cells make still other cells, and——"

"Aw, cut that stuff out and talk sense," Bill pleaded.

"All right, Bill, I will talk sense as soon as you are ready to let me do so," I answered. "I can't talk sense all of a sudden, can I?"

"No, I guess not," Bill agreed.

"Well, these cells I was talking about," I went on, "are so small that you need a powerful micro-

scope to see them. Each cell breaks in two and forms two cells, and so on. Well, sometimes one of these little cells does not work right, and the cell next to it has to do two cells' work and it can't do it, so it, too, quits the job. Pretty soon there is a sort of a commotion and the whole slew of cells quit working, and the blood circulation is irregular. This causes congestion and pretty soon you see a little red spot on the skin and you pay no attention to it. In the meantime, these cells are being killed by the poison of the dead cells and a swelling appears on the back of your neck, and you still do not mind it because you are hard boiled. Then a carbuncle is formed and you get a sore neck and you can't work, and you hate everything in the world till the doctor gets the poison out and the cells become respectable again and go to work. That's all there is about it, Bill."

"Well, that's enough, I'll tell the world," Bill replied.

"Come to think of it, Bill," I ventured to say, "that is just what is the matter with this sheet metal association in your town."

"What sheet metal association?" Bill asked. "There is no association in this town."

"That's just what I mean," I said. "There was one here several years ago, but the carbuncle got its goat. There were seventeen shops in this town, and once upon a time there was a fine association, and every member was a little cell in that body. Well, one day one cell by the name of Bill Ward quit working for the association body and made some other fellow do twice as much work. Bill was a dead cell as far as association was concerned, and got several other cells to stop working. This poisoned the association and a little red spot appeared. You see, Bill, the circulation became so poor that the swelling came to a head and the commercial carbuncle was formed and killed the association. Now it is dead. There are carbuncles in business as well as on the back of your neck, Bill."

For a moment Bill was as silent as a clam. A far away look showed in his eyes. Finally he ventured to say:

"I believe you do know a lot about carbuncles all right, old friend. I begin to see where I really was the cause of killing that old association. I was proud of it then, but this explanation you gave me is as true as anything you have ever said."

"What are you going to do about it, Bill?" I asked. "Are you going along the way you have been without an association and let each fellow hate the other one? Are you going to let the commercial carbuncle kill business? Remember, Bill, that a single cell can not do much. It takes all of the cells to make a body grow and be healthy. There are now twenty-six shops in this town, and no two men in the sheet metal business know the rest of the craft. Business will be as poor as all of you make it. Get on the job as soon as you are well again and get the old cells working again. Be the doctor who will cure your problems and do away with carbuncles."

"When a man talks sense to me," Bill answered, "I am always ready to listen. I will guarantee that we will have an association here stronger than ever. I'm offa carbuncles."

Are you a cell that is ready to quit working and let the poison gather? Are you a poison cell that can see no good in real association activity, and are trying to get by?

Get busy and keep commercially healthy and work always for the good of your bread and butter. Remember what Roosevelt said? He said:

"Every man owes some of his time for the uplifting of his profession."

You owe your associaiton your best ideas and uplift. Give your ideas and get new ones for them. That is progress. Carbuncles are sure bad on the back of your neck, but once they are in our business, the man who is not responsible for it is made to suffer.

Tells How Copper Leaching Was Discovered.

An account of how the leaching process of copper recovery, by which millions of pounds of copper are recovered every year, was first discovered is given in a letter to the New York Herald by William A. Willis, manager of the Copper and Brass Research Association. Mr. Willis' letter says in part:

"In November, 1889, there was a disastrous fire in the copper mines in the Butte district of Montana.

"The heat from this fire caused a slow roasting of the copper sulphide bearing minerals, exactly as happens in the first operation in a smelter.

"The resulting sulphate of copper dissolved in the water which was pumped into the mines in large quantities to extinguish the fires.

"Reaching the surface this water flowed across a wagon road in a shallow stream.

"The local junk dealer, one Jim Ledford, allowed his wagon to stand for some time in this stream.

"When he drove home he discovered a heavy deposit of copper on the iron tires of his wagon wheels.

"Jim was no metallurgist, but he was keen enough to see that he had discovered something.

"He applied for and obtained the right to control the entire water supply from the mines.

"This he diverted into a yard in which he stacked huge piles of junk.

"By the time his contract ran out he had cleaned up about $100,000.

"Later the handling of this phase of recovery in the Butte district became a company operation.

"Leaching, as it is called, simply involves the principle of the precipitation of copper in solution.

"There is evidence that it was practiced in a crude way many centuries ago at the famous Rio Tinto mines in Spain, but the commercial application of the process in this country only dates back to Jim Ledford's discovery.

"Curiously enough, another secondary process of copper recovery, known as oil flotation, by which millions of pounds of the metal are saved every year, was discovered by accident.

"The wife of a miner noticed that whenever she washed her husband's overalls quantities of copper in minute grains rose to the surface of her tub in the soap bubbles.

"Engineers were quick to appreciate the significance of this, and the result is the great oil flotation plants which today are recovering huge quantities of copper from the tailings or waste sands of past decades."

The Work of Soldering Automobile Radiators Requires a Special Type of Brazing Outfit.

Acetylene and Gas Oxygen Outfits, Used for Welding, Produce Too Strong a Flame for Soldering Radiators.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by E. E. Zideck, New York City.

ACETYLENE gas and oxygen outfits, used for welding, brazing and lead burning, are not suitable for soldering radiators.

The flame produced by these apparatus is too strong, and no matter how regulated, it will burn the light metal of the core instead of just heating it up to the melting point of solder.

For radiator repairing, then, if the blow pipe flame must be used, coal or gasolene gas and a slight air pressure is the one to use.

Both the natural and the artificial coal gas is suited for that purpose. But each must be used in connection with special blow-pipe tips, which also applies to the gasolene gas.

The blow pipe made for city gas will not do good work with the natural gas, and vice versa; neither will the one or the other work well with the gasolene gas.

In ordering blow pipes, it must be specified for which gas they are to be used.

There are blow pipes for any of the three gases to be had for about the same price, and the repairer will find that it pays to be specific about it.

In the accompanying picture a stand is shown, originally made for brazing purposes, which can be easily converted into a radiator repair stand, with the least possible outlay in money.

The stand has a cast iron top plate large enough to hold the radiator while it is being repaired.

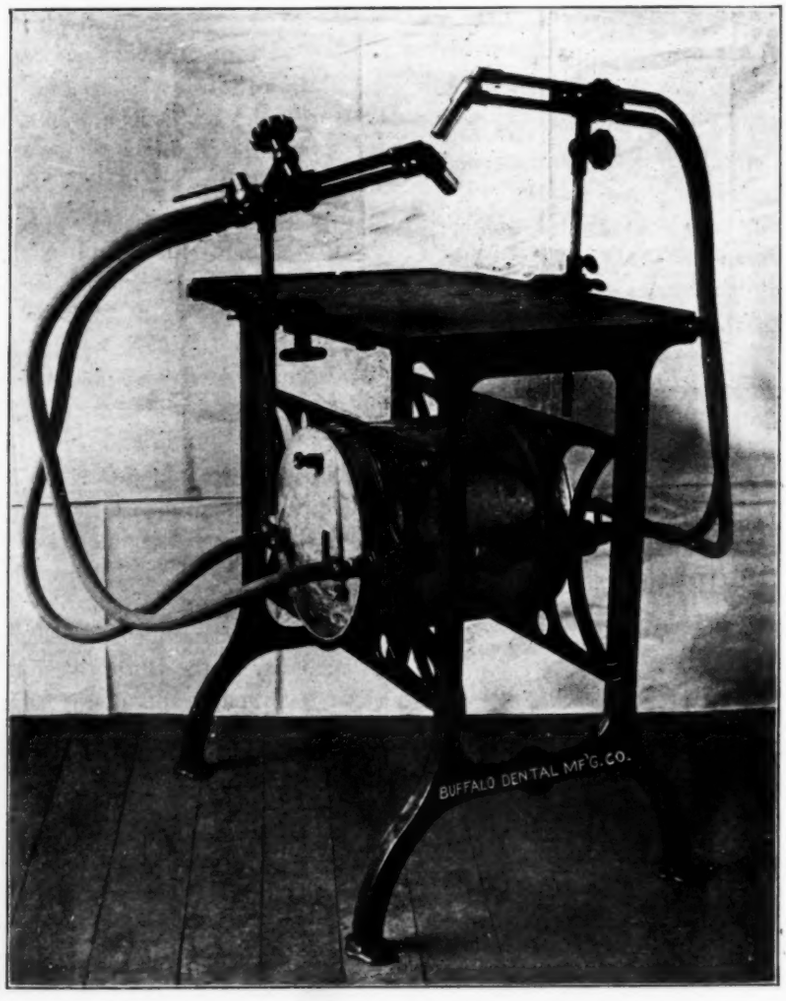
The air drum is large enough for holding air compressed by power; but if a foot blower must be used, it only need to be connected to it, by rubber tubing possibly, and will hold enough pressure for both blow-pipe-soldering and testing.

The stand originally is outfitted with two large size blow pipes for brazing; and it only needs one blow-pipe, for either natural or city gas or gasolene gas, just according to what is used.

The other blow pipe line can be used for testing purposes.

By ordering the stand and specifying that it is to be used for radiator repairing with either of the gases named, the factory will make the desired changes in equipment, add a foot blower and a gasolene gas generator eventually, and the repairer will have a small outfit containing everything he needs and taking the least amount of space in the shop.

These outfits are being illustrated and described in these pages because of the prevalent idea that a



Brazing Stand Described in This Article.

tinsmith or a sheet metal worker can not take in radiators to repair except he has a specially outfitted shop in which to do the work.

If there is no regular radiator repair shop in town and the car owners want the sheet metal man to do the repairing of their radiators, it is a folly to refuse doing the work.

In these cases the small outfits above referred to will prove a good start. They are inexpensive, can be put somewhere in a corner if not used, can be moved to the best lighted and best suitable place in the shop while being used, and will prove sufficient for the occasional stopping of leaks in radiators; also for new core insertions.

Nothing prevents the shop owner to later increase the facilities of repairing radiators in his shop, provided, he sees that it pays and that it can be done by his men without interference with their other work. This, especially, applies to such repairs which can be done quickly and which, by being done in the local shop, will save the owner of the radiator shipping it away and waiting for its return before again being able to use the car.

He will regard it as a favor done him by the tinsmith or sheet metal man and, paying for it adequately, he still will feel obliged to him and try to repay him by speaking well of him and creating trade for him in his legitimate line.

Another use for the small outfit supplementing the regular soldering facilities of the sheet metal shop and enabling it to do work on radiators is the re-coring of them.

The new core work undoubtedly is in line with the general sheet metal or tin work than it is with the mere soldering up of leaks done in garages and automobile repair shops.

The sheet metal shop has more of an equipment to do it with; and the sheet metal men are more handy at the new-core work than the repairer simple and pure is.

And it is a fact, that an entire new core inserted by the local sheet metal shop will cost the owner of the radiator less than it would cost him to have the leaks patched in the garage or, the radiator shipped away to be repaired.

Regular radiator repair establishments, whether conducted separately or in connection with sheet metal shops, more and more regard the re-coring of radiators as the safest and quickest means of repair, and are trying to convince the owners that it is best for them also.

Patching repairs seldom last long enough to justify the work involved in dismounting the radiator, soldering it, and mounting it back again.

The time consumed is about the same as it would take to solder in a new core.

In many cases it is more. And the owner thinks he is being held up if he is charged for something which he can not see.

In comparison with the cost of patching the old core, the cost of the new core inserted is the more reasonable—at least, that is what the owner of the radiator believes it to be.

And since a great number of the smaller leaks are being stopped by the various anti-leak preparations, and the repairer gets the radiator only when the core leaks so badly that the preparations will not stop it from leaking, it is but reasonable not to try to solder upon the impure metal and the out-opuring of the momentary leak-stopper as soon as it is brought in contact with the heat of the soldering tool, but to tell the owner that it will cost him so-and-so-much to have a new core instead.

Many a core will look as if there was nothing matter with it, and still, the leaks will be too many and too hard to solder up.

The repairer will find a new leak every time he solders up the old one and puts the radiator to test.

If he repairs it, finally, and charges adequately for the time it took him, the owner will be horrified and, even if he pays without saying anything, he will talk when he is out and blacken the repairer's reputation.

On the other hand, if the repairer explains to him the situation and gets his order for the new core to be inserted, the owner, even after paying twice as much as he would for patching, still thinks that he got his money's worth—which he actually did.

Not every radiator mounted upon a car, truck or tractor was a first rate product when mounted.

Many a core in the new radiators is far less up-to-date and of the cooling capacity required by the motor. The Ford is a proof of it.

And the replacement cores, now used, are in many respects superior to the cores still being used in the factories making new radiators And that is one of the reasons why a new core inserted into an old radiator will satisfy the owner

(To Be Continued.)

In Granting Credit, It Is Better to Be Safe Than Sorry.

Ten good guides to be observed in the granting and handling of credits are as follows:

1. Know your customer before extending credit.

2. The time to find out about a customer is before his name goes on your books.

3. Insist upon references and investigate them before extending any credit to strangers.

4. When the prospective customer hesitates to give references—you hesitate in extending credit.

5. Have the courage to say "NO."

6. Explain that it is necessary to have prompt payments of accounts in order that you may be prompt in paying yours.

7. Do not let your customers decide when they want to pay their bills; that is your job.

8. Remember that the possible loss of a few customers who will not pay promptly is really an asset to your firm's business.

9. Trade reports on a party are good, but not always dependable. Learn something about his character and general reputation. In other words—learn the moral hazard.

10. Boost your rating bureau and co-operate with it in every way possible to make the service more efficient.

Heavy Sheet Bronze Is Used In Making Monument Honoring World War Heroes.

Another Instance of Preference for Metal as Against Materials Which Deteriorate Quickly.

WHILE we have no particular antipathy for those who are engaged in making or selling products made of other materials, we are naturally interested in calling attention to and promoting the use of sheet metal wherever justified.

And here we have a specific case:

For statues, memorials and similar works of art it has been proven that metal—whether in solid cast or in sheet form—not only lends itself with better effect to the artistic ideas of the sculptor, but also lasts much longer than any other material, except possibly pure Italian marble.

War Monument Made of Sheet Bronze. Designed and Made by Gerock Brothers Manufacturing Company.

Europe can furnish thousands of examples of metal statues which show absolutely no ill effect of wind, storm, rain, snow or climatic influences, and many of them have been subjected to these influences for centuries.

In the accompanying illustration is shown a reproduction of the monument which has recently been erected in the court house square of Anadarko, Oklahoma, in memory of the 48 boys from Caddo County, who gave their lives in the World War, Anadarko being the capital of Caddo county.

This memorial is built entirely of heavy sheet bronze, except the pedestal which is not visible in the illustration, and is 18½ feet in height, and about six feet square at the base.

The overseas soldier is life size—six feet. He carries full overseas equipment, rifle in right hand and a large American flag in the left.

On each side of the base of the upper pedestal twelve stars, made of gold-leafed plate glass and the name of a fallen hero engraved thereon, are fastened, and in the front panel the photographs of the 48 soldiers are displayed, with this superscription:

"Our brave boys of Caddo County, who gave their lives in honor of their country's cause in the Great World War."

The monument was modeled and produced in the art shops of the Gerock Brothers Manufacturing Company, Saint Louis, Missouri.

Julius Gerock, Jr., the president of this Company, is well known among the sheet metal contractors, as he has been active in the association activities of that trade for years, in fact, since the inception of the National Association of Sheet Metal Contractors.

The Company is one of the most prominent among those which specialize on architectural and ornamental sheet metal work, but in addition to the regular variety of spun and pressed work for buildings, they also give special attention to unusual designs in sheet metal work, such as floor lamps, urns, etc.

Use of Zinc Is on the Increase.

"Zinc sheets have found many new uses," said one roller, "but it's not new uses that we want. Why the trade is asleep! We hear how much zinc the shoe lace trade will use for tips, how much the garter trade will use, and only yesterday we had an inquiry from a man for car seals, another new use of the metal.

"This gentleman wanted to purchase a large tonnage—he placed an order for 500 pounds—to be used in the manufacture of car seals, and said perhaps his business would run about 20,000 pounds a year. This is mere pikers business. We want tonnage!

"There is enough zinc in the United States—I refer to known deposits of commercial quality—to roof every building and home in United States with zinc.

"About a year ago the zinc trade woke up from a long sleep.

"They entered the roofing business. Most men in the trade were doubtful of its success.

"They hesitated after being shown that all the zinc producing and zinc rolling countries in Europe were using 95 per cent of the metal for roofing.

"The leading interest in this country today says that approximately 15 per cent of all their orders this year have been for roofing.

"Only last year the firm entered the roofing business. At the present rate of growth the roofing business alone within the next decade will use more zinc than all other users combined.

"Only this morning we received an order for 116,000 pounds of corrugated roofing.

"All the railroads out of Chicago are using zinc for their shops.

"All the sugar planters in Cuba and South America are employing zinc for roofing.

"We have a plentiful supply of zinc in this country. And we laugh every time someone mentions the fact that the metal is scarce.

"Present stocks are low, but the public in many cases take the figures on present stocks to mean the actual amount contained in this country."

Another member of the trade commenting on the so-called "green zinc" which is supposed to be soon placed on the market said:

"Green zinc is impossible! The natural color of zinc is pleasing to the eye. Of course, green zinc would be nice for roofing.

"In fact, it is intended to compete with the various colored copper shingles and sheets.

"The manufacturer of the green zinc forgets, however, that if he introduces coloring matter into the molten metal he will make it impossible to roll.

"Less than one-half of one per cent impurities would ruin the zinc for rolling.

"If the manufacturers of the green zinc put oxide into the molten metal the product resulting from the union thereof can not be rolled."

A rolling mill representative said: "We are forced to accept orders from old customers.

"The continuance of the coal strike will materially affect our trade.

"We are unable to fill orders quickly enough to hold customers.

"There is no dearth of ore. Approximately 25 per cent of the zinc mines in this country are working.

"Other mines will resume as soon as the mills can handle their output.

"Just at present we are faced with the proposition of supplying old customers first.

"This prevents us from developing or accepting new business and will eventually if the strikes are prolonged, severely hurt our business.

"We are making every effort to supply all demands in minimum time, but our efforts have not pleased everybody.

"The whole zinc trade anxiously awaits the settlement of the coal strike."

Notes and Queries

"Acme" Lawn Mower.

From North Shore Hardware Company, 618 Davis Street, Evanston, Illinois.

Will you please advise us who manufactures the Acme lawn mower?

Ans.—It was formerly made by the American Lawn Mower Company, Muncie, Indiana, who have discontinued manufacturing it.

Folding Canvas Bath Tub.

From Klinefelter and Greenwell, Versailles, Illinois.

Please tell us where we can get a folding bath tub made of canvas.

Ans.—Gold Medal Camp Furniture Manufacturing Company, Racine, Wisconsin, and George B. Carpenter and Company, 440 North Wells Street, Chicago, Illinois.

Enameled Steel Table Tops.

From Ruud and Knain, Northwood, North Dakota.

Can you tell us where we can get enameled steel table tops in different sizes?

Ans.—Enamel Products Company, Eddy Road and Taft Avenue, Cleveland, Ohio; Vitreous Enameling Company, Grant Avenue, Cleveland, Ohio, and Vitreous Steel Products Company, Nappanie, Indiana.

Bird Bath.

From Ruud and Knain, Northwood, North Dakota.

Please advise us where we can buy a small outdoor fountain or bird bath to be placed on lawn or in the garden, and to be connected with the water supply from house.

Ans.—Decorators Supply Company, 2547 Archer Avenue, Chicago, Illinois.

Garbage Incinerators.

From W. A. Standen, 308 South River Street, Eau Claire, Wisconsin.

Will you kindly advise me where I can get garbage incinerators for residences?

Ans.—Guardian Gas Appliance Company, 2409 Superior, Cleveland, Ohio; Chicago Incinerator Company, 320 East North Water Street, Chicago, Illinois; Kerner Incinerator Company, 596 Clinton Street, Milwaukee, Wisconsin, and M. J. Cragin, 746 East 43rd Street, Chicago, Illinois.

Review of Conditions in the Metal Markets.

General Situation in the Steel Industry. Report of Prices and Tendencies in Sheet Metals, Pig Iron, etc.

STRIKES HOLD BACK COPPER BUYING.

To a considerable degree the prevailing strikes are holding back copper buying.

Domestic consumers are conservative but are testing the market while buying little.

Not until the labor situation is adjusted can any important buying by domestic consumers be expected; also there is less buying by foreign consumers.

Industrial as well as political affairs in Europe are not reassuring.

In the circumstances, the hesitancy on the part of consumers here and abroad is only natural.

Manufacturing plants in the Connecticut Valley, while well supplied with orders for several months, are threatened with the necessity of curtailing production, either because of lack of fuel and shortage of copper or scarcity of labor.

Consumers are taking small orders for electrolytic at 14 cents delivered for any shipment up to and including October, although some are nominally asking 14 cents delivered.

Offerings are still being made by second hands at 14 cents delivered at interior points, some sales being made in the last two days at this price for October and November shipment and also at 13⅞ refinery, although generally, holders are asking 14 cents refinery for delivery over the remainder of the year.

Some copper is available even for shipment over the first quarter of next year at 14 cents refinery.

Export business is light and prices are nominally unchanged at 14 cents, free aboard steamer, New York, for electrolytic and 13½ steamer, for casting.

Exporters have few if any commissions.

The largest interest continues to take business in Europe at 14.20 cents to 14.25 cents, cost, freight, and insurance, European points.

Statistically, there is little of interest to add to what has previously been noted.

Reserve stocks in hands of producers available for domestic shipment are light but apparently with current production are ample to meet requirements from day to day.

Tin.

Estimates of this month's shipments of tin from the east run up to about 7,000 tons, and if this should prove to be the case, and the American deliveries be no better than they were in July, we may expect reaction in prices, which, however, are not unreasonable.

The market has been very much complicated lately by the enormous option dealings, and until the major portion of these are settled, the outlook will remain uncertain.

Lead.

Following the announcement at the beginning of the week of an advance of $3.00 per ton and its contract price, a large volume of business is reported to have come out.

The western outside market has followed the advance though as yet not quite to the full extent and prompt lead is quoted at 5.65 cents East St. Louis basis.

Good sized bids are in the market at a shade below that figure, and the general tone is firm.

In the New York district the outside market is about on a par with the "official" price of 5.90 cents, but supplies for immediate delivery are not plentiful.

A new export rate on lead to Gulf ports is announced effective September 15th of 29 cents from East St. Louis, Federal and Herculaneum, Missouri.

At present, however, there is, of course, no export movement from the interior.

Solder.

Chicago warehouse prices on bar solder are as follows: Warranted 50-50, per 100 pounds, $22.25; Commercial 45-55, per 100 pounds, $20.75; and Plumbers' 40-60, per 100 pounds, $19.50.

Zinc.

The zinc market is not very active, but some inquiry is reported, mainly for early shipment.

There appears to be little available below 6.25 cents a pound, and none of the leading producers were showing much disposition to quote or offer freely this week. The strength of the market, therefore, arises mainly from a paucity of offerings and so much for momentary demand.

The ore market is strong with the volume of sales well maintained at ruling prices.

A fair supply of cars for moving ore arrived in Joplin early last week, but at the close shippers were restricted to a more limited supply.

Shipments were increased 1,800 tons over the previous week, but purchases were 1,500 tons less.

Sheets.

Sheet mill operations are averaging in the neighborhood of 65 per cent of total capacity.

The chief restrictive influence is steel, there being few cases where steel is available and coal for heating, power and annealing is not.

No predictions are being made as to how sheet production will be running a few months hence.

As the trend in production at present is downward it is considered out of place to begin making predictions as to increasing production.

The leading interest has booked a considerable tonnage of business in the past few days, there being indeed quite a rush.

This is due, of course, to the com-

pany having been out of the market for a while during which time customers formulated requirements and got them in shape ready to place as soon as the opportunity was afforded.

Nominally the business is fourth quarter business, but this is the designation of the buyer rather than the seller, for the seller makes no positive promise and is virtually selling for delivery at mill convenience.

Some of the business is referred to as being for November and December delivery, by customers whose third quarter deliveries will lap over into fourth quarter.

Tin Plate.

So far as sellers of tin plate are concerned, they are a unit in asserting that the $4.75 price, Pittsburgh base, is being maintained.

There was quite a period of price shading recently but it is said that this has disappeared.

In the past nine or ten months, or since there began to be business done for this year's delivery, the periods in which $4.75 was being shaded, sometimes deeply, have been much more extensive than the periods when the price was firmly maintained.

In the retrospect, it would almost seem as if the firm periods were those in which the volume of current business was the lightest, demand operating to weaken the price rather than to stiffen it.

In the face of this rather impressive history of the tin plate market, remarks have lately been made by some mills that an "advance" in tin plate was likely, and in a few quarters these remarks appear to have been taken seriously.

As a matter of fact there is no prospect of there being any advance in tin plate above $4.75.

One might, of course, twist words by speaking of an "advance" and really meaning a lessening in the depth of the cutting. If so, the advance has already occurred.

Some of the independent mills are operating nearly all their mills, while a few are running rather lightly.

In some cases the mills in operation are not getting out full tonnages each week.

The actual production among independents seems to be about 70 per cent of full capacity, while last week the leading interest operated a trifle more than 60 per cent of its mills, getting substantially full tonnages from those operated.

Roughly speaking, therefore, production of tin plate is at about two-thirds of capacity.

Demand is light at the present time, as there is little more opportunity to buy against the canning crops, and other consumers are not yet taking much interest in deliveries for late in the year.

Old Metals.

Wholesale quotations in the Chicago district which should be considered as nominal are as follows: Old Steel axles, $15.50 to $16.00; old iron axles, $21.50 to $22.00; steel springs, $15.50 to $16.00; No. 1 wrought iron, $13.00 to $13.50; No. 1 cast, $15.50 to $16.00, all per net tons. Prices for non-ferrous metals are quoted as follows, per pound: Light copper, 8½ cents; light brass, 4½ cents; lead, 4¼ cents; zinc, 2½ cents; and cast aluminum, 12 cents

Pig Iron.

Fair quantities of No. 2 foundry pig sold last week at $29.50 valley, with a subsequent advance to $30, at which figure the market is now quoted.

While new inquiry is not very active at the moment, most of the orders which are coming through specify prompt shipment, and foundry is moving rather well in carload lots.

Supplies of iron for prompt shipment are light, and as a result buyers who are seeking stocks to cover emergency requirements are offering premiums to get the supplies in a hurry.

The Feature of the Week in Steel Was an Advance of Twenty Per Cent in Wages.

It Is Generally Believed That This Wage Increase Will Be Followed by a Rise in the Prices of Steel Products.

INCREASED costs of production throughout the steel industry are reflected this week in advancing prices.

Some products which had been stable for months yielded to the higher costs of steel making and moved upward.

For instance, wrought iron pipe, plain and galvanized, was marked up $10 per ton, the first change since Sept. 1, 1921.

Another commodity which has been stable since practically the first of the year is wire nails at $2.40 per keg base for the corporation and $2.50 for the independent steel companies.

Now one prominent maker has advanced these to $2.60 and others will follow.

Conspicuous for its stability has been tin plate, which has held at $4.75 per box since early in the year, while other kindred products such as sheets have been advancing.

As tin plate is more or less seasonal and inasmuch as purchases have been made to take care of this season's requirements for canning fruits and vegetables, makers doubtless decided it was no use to advance prices now.

A general advance of 20 per cent in wages for common labor in the steel industry has been announced to become effective September 1st.

It is believed that this wage increase will bring about further advances in steel prices in the near future.

Orders placed in July were at the rate of 61 per cent of shop capacity, as against 71 per cent in June.

It is estimated that structural steel orders so far in August were 60,000 tons, which indicates the same rate of booking as last month.

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry..	$30 00
Southern Fdy. No. 2	26 00 to 27 00
Lake Sup. Charcoal	34 65
Malleable	30 00

FIRST QUALITY BRIGHT TIN PLATES.

		Per Box
IC	14x20 112 sheets	$10 00
IX	14x20	11 25
IXX	14x20	12 60
IXXX	14x20	13 90
IXXXX	14x20	15 25
fC	20x28	20 00
IX	20x28	22 50
IXX	20x28	25 20
IXXX	20x28	27 80
IXXXX	20x28	30 50

COKE PLATES.

Cokes, 180 lbs...	20x28	$11 80
Cokes, 200 lbs...	20x28	12 00
Cokes, 214 lbs...IC	20x28	12 35
Cokes, 270 lbs...IX	20x28	14 10

BLUE ANNEALED SHEETS.

Base .....per 100 lbs. $3 75

ONE PASS COLD ROLLED BLACK.

No. 18-20.....per 100 lbs.	$4 40
No. 22-24.....per 100 lbs.	4 45
No. 26.....per 100 lbs.	4 50
No. 27.....per 100 lbs.	4 55
No. 28.....per 100 lbs.	4 60
No. 29.....per 100 lbs.	4 70

GALVANIZED.

No. 16.....per 100 lbs.	$4 85
No. 18-20.....per 100 lbs.	5 00
No. 22-24.....per 100 lbs.	5 15
No. 26.....per 100 lbs.	5 30
No. 27.....per 100 lbs.	5 45
No. 28.....per 100 lbs.	5 60
No. 30.....per 100 lbs.	6 10

BAR SOLDER.

Warranted.
50-50 .....per 100 lbs. $22 25

Commercial.
45-55 .....per 100 lbs. 20 75
Plumbers .....per 100 lbs. 19 50

ZINC.

In Slabs 6 95

SHEET ZINC.

Cask lots, stock.....8¾c
Less than cask lots.....9¼c

COPPER.

Copper Sheets, base.....20¾c

LEAD.

American Pig	6 05
Bar	6 80
Sheet.	
Full coils ....per 100 lbs.	9 00
Cut coils ....per 100 lbs.	9 25

TIN.

Pig Tin .....per lb. 35½c
Bar tin 37½c

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.
Barton's .....Net
White's .....Net

AMMUNITION.

Shells, Loaded, Peters.
Loaded with Black Powder 18%
Loaded with Smokeless Powder 18%
Winchester.
Smokeless Repeater Grade .....20 & 4%
Smokeless Leader Grade .....20 & 4%
Black Powder .....20 & 4%
U. M. C.
Nitro Club .....20 & 4%
Arrow .....20 & 4%
New Club .....20 & 4%

Gun Wads—per 1000.
Winchester 7- 8 gauge 10&7½%
" 9-10 gauge 10&7½%
" 11-28 gauge 10&7½%

ASBESTOS.

Paper up to 1/16.....6c per lb.
Rollboard .....6¼c per lb.
Millboard 3/32 to ⅛.....6c per lb.
Corrugated Paper (250 sq. ft. to roll).....$6.00 per roll

AUGERS

Boring Machine.....40&10%
Carpenter's Nut 50%
Hollow.
Bonney's.....per doz. $30 00
Post Hole.
Iwan's Post Hole and Well .....30 and 5%
Vaughan's, 4 to 9 in., without handles per doz. $14 00

AWLS.

Brad.
No. 3 Handled..per doz. $0 65
No. 1050 Handled " 1 40
Patent asst'd, 1 to 4 " 35
Harness.
Common .....per doz. $1 05
Patent ..... " 1 00
Peg.
Shouldered ..... " 1 60
Patented ..... " 75
Scratch.
No. 18, Socket Handled .....per doz. $2 50
No. 344 Goodell-Pratt, list less.....35-40%
No. 7 Stanley....per doz. $2 25

AXES.

First Quality, Single Bitted (unhandled), 3 to 4 lb., per doz.....$10 50
Good Quality, Single Bitted, same weight, per doz. 9 50

BALANCES, SPRING.

Universal.
Sight Spring.....List less 25%
Straight .....List less 25%

BARS, WRECKING.

V. & B. No. 12	$0 34
V. & B. No. 24	0 43
V. & B. No. 324	0 57
V. & B. No. 30	0 48
V. & B. No. 330	0 63

BEVEL, TEE.

Stanley's Rosewood handle, new list .....Nets
Stanley iron handle.....Nets

BINDING CLOTH.

Zinc 55%
Brass 40%
Brass, plated 60%

BITS.

Auger.
Jennings Pattern.....Net
Ford Car.....25% off
Ford's Ship.....25% off
Irwin 35%
Russell Jennings.....less 10%
Clark's Expansive.....33⅓%
Center 10%
Countersink.
American Snailhead..... 1 75
" Rose 2 00
" Flat 1 40
Dowel.
Russel Jennings .....plus 20%
Gimlet.
Standard Double Cut Gross $3 40
Nail Metal Single Cut .....Gross $4 00—$5 00
Reamer.
Standard Square....Doz. $2 50
American Octagon.. " 2 50
Screw Driver.
No. 1 Comomn.....Each 18c
No. 26 Stanley.....Each 70c

BLADES, SAW.

Wood.
Atkins 30-in.

Nos.	6	40	26
	$8 90	$9 45	$5 40

Diston 30-in.

Nos.	6	66	26
	$9 45	$10 05	$9 45

BLOCKS.

Wooden 20%
Patent 20%

BLOW TORCHES (See Firepots).

BOARDS.

Stove.	Per. Doz.
26x26, wood lined	$14 45
28x28, " "	16 95
30x30, " "	19 00
26x26, paper lined	8 15
28x28, " "	9 10
30x30, " "	10 80

Wash.
No. 760, Banner Globe (single) .....per doz. $5 25
No. 652, Banner Globe (single) .....per doz. 675
No. 801, Brass King, per doz. 3 25
No. 860, Single—Plain Pump 6 25

BOLTS.

Carriage, Machine, etc.
Carriage, cut thread, ⅝x6 and sizes smaller and shorter 60%
Carriage sizes, larger and longer than ⅝x6....50 & 5%
Machine, ⅝x4 and sizes smaller and shorter.....60 & 10%
Machine, sizes larger and longer than ⅝x4..50-10 & 5%
Stove 75%
Mortise, Door.
Gem, iron 5%
Gem, bronze plated.....5%
Barrel.
Cast .....Net
Wrought ..... "
Wrought, bronzed ..... "
Flush.
Wrought .....Net
Spring.
Wrought ..... "
Wrought, heavy ..... "
Square.
Wrought ..... "

BOXES.

Mail. No..	2	4	10
Per doz.	$18 00	$23 00	$29 00

Cast Iron.
Per doz. $9 50
Miter.
Stanley's..... Net Prices
Stearns, No. 2..per doz. $48 00

BRACES, RATCHET.

Goodell-Pratt No. 408	$4 60
" " No. 410	4 80
" " No. 412	5 00
V. & B. No. 444 8 in.	4 65
V. & B. No. 333 8 in.	4 20
V. & B. No. 222 8 in.	4 00
V. & B. No. 111 8 in.	3 50
V. & B. No. 11 8 in.	3 05

BURRS, RIVETING.

Copper Burrs only.....50%
Tinners' Iron Burrs only....Net

BUTTS.

Steel, antique copper or dull brass finish—case lots—3½x3½...per dozen pairs $2 75
4x4..... " " " 3 80
Heavy Bevel steel inside sets, case lots—.....per dozen sets 7 50
Steel bit keyed front door sets, each 1 80
Wrought brass bit keyed front door sets, each.... 2 25
Cylinder front door sets, each 7 00

CALIPERS.

Double .....Net
Inside and Outside ..... "
Wing ..... "

CARRIERS.

Hay.
Diamond, Regular...each, nets
Diamond, Sling..... " "

CASTERS.

Standard—Ball Bearing. .....50 & 10%
Bed 40%
Common Plate.
Brass Wheel 15%
Iron and porcelain wheels, new list 50%
Philadelphia Plate, new list 50%
Martin's 40%

CATCHERS, GRASS.

No. 160S.....per doz. $12 25
No. 165S..... " 14 01

CEMENT, FURNACE.

American Seal, 5 lb. cans, net	$0 45
" " 10 lb. cans, "	90
" " 25 lb. cans, "	1 87
Asbestos, 5 lb. cans..... "	45
Pecora, 5 lb. cans..... "	45
" 10 lb. cans..... "	90
" 25 lb. cans..... "	1 87

CHAINS.

Breast Chains.
With Slide....doz. pairs, $5 50
Without Slide.. " 5 06
Doublestack .... " 9 35
With Covert Snaps " 6 32
Picture Chains.
Light brass, 3 ft., per doz. 1 25
Heavy brass, 3 ft. " 1 75
Sash Chain. (Morton's)
Steel, per 100 ft.
0 .....$2 50
2 ..... 3 10
1 ..... 3 60
Champion Metal.
0R 5 40
2R 5 60
1R 7 75
Champion Metal.—Extra Heavy.
1H $9 50
Cable Sash Chains.
Steel.....List Net Plus 15%

CHALK, CARPENTERS'.

Blue .....per gro.	$2 00
Red ..... "	2 00
White ..... "	1 80
Common White School Crayon ..... "	0 30

CHIMNEY TOPS.

In bags.....per bag $1 80

CHECK, DOOR.

Corbin .....Net list
Russwin .....Net list

CHISELS.

Cold.
V. & B. No. 25, ¼ in., each $0 26
V. & B. No. 25, ⅝ in., each 41
Diamond Point.
V. & B. No. 15, ¼ in..... 0 31
V. & B. No. 15, ½ in..... 0 48
Firmer Bevelled.
Round Nose.
V. & B. No. 65, ¼ in..... 0 31
V. & B. No. 65, ½ in..... 0 40
Socket Firmer.
Cape.
V. & B. No. 50, ⅜ in..... 0 31
V. & B. No. 50, ¾ in..... 0 57

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers.....List less 35-40%
Yankee, for Yankee Screw Drivers $6 00

CHURNS.

Anti-Bent Wood, Gal.	5	7	10
Each	$3 00	$4 60	4 85

Belle, Barrell.....65 & 7½%

Common Dash, Gal.	5	7
Per doz.	$17 00	19 00

CLAMPS.

Adjustable.
Martin's 30%
No. 62, Screw.....20%
Cabinet.
Screw 20%
Carpenters'.
Steel Bar..List price plus 20%
Carriage Makers'.
2½-inch.....per doz $ 7 00
5 - " ..... " 14 00
8 - " ..... " 25 00
12 - " ..... " 42 00
Hose.
Sherman's brass, ¾-inch per doz. $0 48
Double, brass, ¾-inch, per doz. 1 20
Saw Filers.
Wentworth's, No. 1, $12.50; No. 2, $18.25; No. 3, $16.25.

CLAWS, TACK.

Wood hdl. No. 10..per doz.	$1 15
Forged steel, wood hdl. "	2 15
Solid steel ..... "	3 25
Giant ..... "	60

CLEVISES.
Malleable .....10c lb.

CLIPPERS.
Bolt (Carolus).
No. 0.....$2 50
No. 1..... 3 25
No. 3..... 4 25

CLIPS.
Axle .....65&5%
Damper.
Acme, with tail pieces, per doz. $1 25
Non Rivet tail pieces, per doz. 25
Non Rivet Clips..... 90
Hame ..... " 50c

COLLARS, STOVE PIPE.
Lacquered.
Inches..... 5 6 7
Fancy pattern, per doz.....65c 75c $4 00

COMPASSES.
Carpenters' 15%

COPPERS—Soldering.
Pointed Roofing.
3 lb. and heavier....per lb. 40c
2½ lb..... " 45c
2 lb..... " 48c
1½ lb..... " 55c
1 lb..... " 60c

CORD.
Picture.
White Wire.....60 & 5%
Sash.
Spot No. 7.....per lb. 65c
Common, No. 7..... " 40c

COTTERS, SPRING.
All sizes 37½%

COUPLINGS, HOSE
Brass .....per doz. $2 25

CUT-OFFS
Standard gauge.....35%
26 gauge.....20%

CUTTERS.
Glass.
Red Devil.....Net
Meat.
Enterprise—Nos. 5 10 12
Each $2 50 $4 25 $3 75
Nos. 22 32
" $6 50 $8 50
Pipe.
Saunder's, Nos. 1 2 3
Each $1 85 2 75 6 75
Slaw and Kraut. Per doz.
4-knife Kraut.....$20 00-55 00
3-knife Kraut.
8x27 in. 13 00-18 00
1-knife Slaw..... 2 50
2-knife Slaw..... 3 00
Washer 11 00

DAMPERS, STOVE PIPE.
Diamond.
6-inch .....per doz. $1 50

DIGGERS.
Post Hole.
Iwan's Split Handle (Eureka)
4-ft. Handle...per doz. 15 00
7-ft. Handle...per doz. 20 00
Iwan's Hercules pattern, per doz. 18 00
Dividers, Wing 25%

DRILLS.
Bench.
Blacksmiths' Twist (New List) 40%
Breast.
Millers Falls No. 12, per doz. $45 50
Millers Falls No. 112, per doz. 32 00
Hand.
Goodell's Automatic.
No. 01.....each $1 60
No. 03..... " 2 00
Goodell-Pratt No. 4½ " 3 00
Goodell-Pratt No. 379. " 4 00
Reciprocating.
Goodell's ..... " 3 20

DRIVERS, SCREW.
Standard .....Nets

EAVES TROUGH.
79% of Standard List.
Milcor .....Net

ELBOWS—Conductor Pipe.
Galvanized Steel, Tin and Terne Plain Round or Round Corrugated
2 to 6 inch, Std. gauge ..65%
2 to 6 inch, 26 gauge 45%
2 to 6 inch, 24 gauge 20%
Milcor .....Net
Square Corrugated.
Standard gauge 50%
26 Gauge 30%
Milcor .....Net
Portico Elbows.
Standard Gauge Conductor Pipe, plain or corrugated.
Not Nested .....70&5%
Nested solid .....70&5%

ELBOWS—Stove Pipe.
1-piece Corrugated, Uniform

	Doz.
5-inch	$1 25
6-inch	1 40
7-inch	1 80

Special Corrugated.

	Doz.
6-inch	$1 15
7-inch	1 60

Uniform, Collar Adjustable

	Doz.
5-inch	$1 60
6-inch	1 80
7-inch	2 25

FACES, WOOD—50% off list.

FENCING.
Lawn fence, single space, 36-inch .....$ 9 12
Lawn fence, single space, 42-inch 10 20
Lawn fence, double space, 32-inch 12 50
Lawn fence, double space, 42-inch 13 75
Field fence, 26-inch, No. 10 top and bottom 12 filling 26 50
Same, 6 filling..... 33 82
Field fence, 32-inch, No. 10 top and bottom 12 filling 30 34
Same, 6 filling..... 39 41

FILES AND RASPS.
Heller's (American) 70%
American 70%
Arcade .....60 & 10%
Black Diamond 50-10%
Eagle 60-10%
Great Western .....60 & 10%
Kearney & Foot .....60 & 10%
McClellan .....60 & 10%
Nicholson 50-10-10%
Simonds 60%
J. Barton Smith 50-10-5%
X F .....Net List

FIRE POTS.
Clayton & Lambert's—
East of west boundry line of Province of Manitoba, Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma, Amarillo, San Angelo and Laredo, Texas.....55%
West of above boundry line 52%
Turner Brass Works—

	Ea.
No. 43 Kerosene-Gasolene Master Torch 1 qt.....$5 40	
No. 48 Kerosene-Gasolene Master Torch, 1 qt....	6 73
No. 95 Double Jet Torch, Gasolene, 1 qt.....	6 95
No. 30 Kerosene-Gasolene Torch, 1 qt. (new line).	6 48
No. 33 Single Jet Gasolene Torch, 1 qt.....	6 93

Plumbers' Furnaces.

No. 53 Galv. Iron Tank with Bulb, 7 pts.....	6 75
No. 63 Galv. Iron Tank with Pump, 7 pts.....	7 47
No. 56 Straight Side Steel Tank with Bulb, 7 pts.	8 82
No. 66 Straight Side Steel Tank, with Pump, 7 pts.	9 54

GALVANIZED WARE

	Per doz.
Pails (Competition), 8-qt....	1 65
10-qt.	1 85
12-qt.	2 00
14-qt.	2 20
Wash tubs, No. 1.....	5 30
No. 2.....	6 00
No. 3.....	7 00

GARAGE DOOR HARDWARE
Stanley .....All net

GAUGES.
Marking, Mortise, etc.....Nets
Wire.
Disston's 25%

GIMLETS.
Discount .....65% and 10%

GLASS.
Single Strength, A and B, all sizes 85%
Double Strength, A and B, all sizes 85%

GLUE.
Bulk.
B Amber.....per lb. 35c
A white ..... " 40c
H. S. Amber..... " 32c
Liquid.
Army & Navy.....40%
Le Page's—
List "A".....37½%
List "B".....35 %
List "C".....25 %

GREASE, AXLE.
Wood Boxes.
Frazer's .....per gro. $13 00
Hub Lightning..... 7 50
Wood Pails.
Frazer's, 15 lb. $1.00; 25 lb. $1.50 each.
Hub Lightning, 15 lb. 90c; 25 lb. $1.21 each.

HAFTS, AWL.
Brad.
Common .....per doz. $0 35
Peg.
Patent, plain top " 60
Patent, leather top " 80
Sewing.
Common ..... " 24
Patent ..... " 55

HAMMERS, HANDLED.

	Each, net
Blacksmiths', Hand, No. 0 26-oz. $0 87	
Engineers', No. 1, 26-oz....	87
Farriers', No. 7, 7-oz.....	97
Machinists', No. 1, 7-oz....	67

Nail.

Vanadium, No. 41, 20-oz., each	1 45
Vanadium No. 41½, 16-oz., each	1 45
V. & B., No. 11½, 16-oz., each	1 04
Garden City, No. 111½, 16 oz., each	77
Tinner's Riveting, No. 1, 8 oz., each	72
Shoe, Steel, No. 1, 13 oz., each	65

Tack.
Magnetic.
No. 5, each..... 72

HAMMERS, HEAVY.
Farriers' 20%
Mason's.
Single and Double Face....50%

HANDLES.
Agricultural Tool.
4½-inch, plain...per doz. $3 50
Auger.
Common Assorted, per doz.$0 75
Pratt's Adjustable, Nos. 1 & 2, per doz..... 6 00
Ives' Adjustable..per set 1 35
Axe.
Hickory, No. 1....per doz. 3 00
Hickory, No. 2.... " 2 00
1st quality, second growth 6 00
Special white, 2nd growth 4 50
Chisel.
Hickory, Tanged, Firmer Assorted .....per doz. 55c
Hickory, Socket Firmer, Assorted .....per doz. 70c
Coal Pick 40%
Drifting Pick 40%
File, assorted.....per doz. 30c
Hammer and Hatchet.
No 1, per doz.....$0 80
Second growth hickory, per doz. 1 20
Hay and Manure Fork, Handles, Strap and Ferrule.. ..... per doz. $7 00
Screw Driver.
Assorted .....each 6c
Shovel and Spade.....Net

HANGERS.
Door.
Matchless .....Net
Reliable .....Net
Richards 25%
Garage Door.
(See Garage Door Hdw.)
Conductor Pipe.
Iwan's Perfection.....50%
Milcor Perfection .....Net
Eaves Trough.
Steel hangers 30%
Triple twist wire.....10%
Milcor Eclipse .....Net
Milcor Triplex .....Net
Milcor Milwaukee .....Net

HASPS.
Hinge, Wrought, with staples, Net

HATCHETS.

	Per doz.
Size No. 2 extra quality broad $16 00	
Competitive Grade	12 00
No. 2 Warranted Shingling	12 00
Competitive Forged	8 00

HAY RACK BRACKETS
Wenzleman's No. 1
.....per doz. sets $18 00
Wenzleman's No. 2
.....per doz. sets 19 20

HINGES.
Blind.
Clark's Gravity
No. 1.....per set 45c
No. 2..... " 85c
Gate.
Clarks..... 1 2 3
Hks & Ltch, ea. 85c 1 10 2 40
Hinges only—
Upper $1 25
Lower 1 55
Latches only—
No. 1.....each 28c
No. 2..... " 28c
Screen Door.
1751—3x3 .....doz. $2 00
1753—2½x2½ ..... " 1 95
Spring.
Chicago .....Add 10% to list
Gem 25%
Matchless 40%
New Idea .....per gross $6 90
Wrought Iron.
Per 100 pairs with screws:
Light Strap Hinges, No. 3 $12 00
Heavy Strap Hinges, No. 4 15 75
Light T Hinges....No. 3 12 10
Heavy T Hinges....No. 4 20 00
Extra Heavy T Hinges, ... No. 4 21 50
Screw Hook and Strap.
6 to 12 in...per 100 lbs. $7 75
14 to 20 in... " " 7 50
22 to 36 in... " " 7 25
Screw Hook and Eye.
½ in.....per doz. pair $2 00
⅝ in..... " " 3 50
¾ in..... " " 5 00

HOES.
Garden .....Net

HOOKS.
Awning, No. 60.....Net
Belt.
Brown's .....70&5%
Jones' .....65&5%
Box.
No. 3 10 12
Each $0 29 0 77 0 36
Bush.
Common Axe Handle, per doz. $20 00
Chain.
Inch.. ¼ ½ 5/16 7/16 ⅝
Pr. 100 $7 60-8 10 9 75 11 50 12 60
Clothes Line.
Japanned....per doz. 35c—1 00
Galvanized... " 65c—2 25
Conductor.
Conductor hooks 20-10%
Milcor .....Net
Corn.
Common, riveted, red, per dz. Net
Little Giant..... " "
Grass.
Common Nos. 1 3 5 7
Per doz..$4 25 3 25 3 40 3 50
Hammock.
With plate.....per doz. $1 00
With screw..... " 95
Picture .....50%&50%&10%
Potato and Manure.....Nets

HOSE.

	Per Ft.
¾-inch molded reel 13½c	
¾-inch 3 ply duck.....13½c	
¾-inch 4 ply duck.....16c	
¾-inch 5 ply multiple.....19½c	

IRONS.
Sad.
Charcoal .....per doz. $11 00
Common, polished, per 100 lbs. 7 75
No. 70 Asbestos.....$1 50 net
No. 100 ..... 1 75 net
Common, nickel plated.. 3 25
Mrs. Pott's.
No. 50 J. Enterprise, per set Nets
No. 55 J. " " "
No. 50 T. " " "
No. 55 T. " " "

JACKS.
Wagon.
Richard's No. 1..per doz. $15 00
Oliver.
Each $0 60 $0 80
Nos. 0 00
Standard.
Each $0 60 $1 00
Nos. 1 2
Big Lift 40%
Tiger 40%

KETTLES.
Brass 15%
Cauldron .....40&5%
Copper .....per lb. 27
Maslin .....40&10%
Sugar 50%

KNIVES.
Beet Topping.
Clyde, 9-in. Scimiter Blade, doz. 25%
California 25%
Butcher.
Beechwood Handles, 6-inch blade 25%
Beechwood Handles, 7-inch blade 25%
Beechwood Handles, 8-inch blade 25%
Cooper's Hoop.....25%
Drawing.
Standard 25%
Adjustable 25%
Barton's Carpenters' 25%
Hay.
Iwan's Solid Socket.....25%
Heath's 25%
Iwan's Sickle Edge.....25%
Iwan's Imp'd Serrated....25%
Hedge.
Challenge 25%
Disston's No. 1.....25%
Putty.
Common 25%
Lander's 25%
Scraping.
Beech Handle 25%
Lander's 25%

KNOBS.
Door.
Mineral .....per doz. $2 00
Porcelain ..... " 2 00
Jet ..... " 2 00

LADDERS.
Step.
Common, per ft.....28c
Common, with Shelf, add 10c
IXL 34c
Challenge, 6 to 9 ft.....55c
10 to 16 ft.....60c

LANTERNS.

	Per doz.
Monarch tin, hot blast....$ 8 25	
Dietz No. 2 cold blast....	13 00
Best tubular	8 25
Competition lanterns No. 0 tubular	6 45

LEATHER, LACE.
Rawhide ⅜-inch ....100 ft. $2 00
" ½-inch .... " 4 00

LEATHERS, PUMP.
Valve and Plunger.....Net

LEVELS.

Disston, No. 28 Asst.....$22 05
" No. 18, 20 in..each 1 83
" No. 22, 24 in..each 2 40
" Shafting, 6 in.... 19 80
" " 6 in. gr. glass 24 20
" No. 1 Asst..... 5 75
" No. 9 Asst..... 13 40
" 24-26 in. ....each 1 02
" 28-30 in. ....each 1 60

LIFTERS.

Stove Cover.
Coppered .....per gro. $6 00
Alaska ..... " 4 75
Transom.
Payson's 55%

LINES.

Jute .....per lb. 25c
Sisal ..... " 35c
Cotton ..... " 25c
Braided Cotton ..... " 52c

LINING, STOVE.

Bricks .....per crate 42c

LOCKS.

Barn Door.
No. 60 Stearns..per doz. $12 00
No. 80 " " 24 00

MACHINES

Riveting.
Stearns No. 1...per doz. $16 00
Tenoning.
No. 50 Peace's Spoke, each $16 00

MALLETS.

Carpenters'.
Fibre Head, No. 2 per doz. $16 50
" No. 3 " 19 50
" No. 4 " 28 50
Round Hickory
.....per doz. $3 00— 5 00
Tinners'.
Hickory .....per doz. $2 25

MATS.

Door.
National Rigid .....5&10&5%
Acme Steel Flexible.....50%

MEASURES.

Galvanized, doz.....Nets
Japanned, doz.....Nets

MITRES.

Galvanized steel mitres, and caps, end pieces, outlets...30%
Milcor .....Net

MOPS

Cotton, Star (Cut Ends).
Pounds 12' 15' 18' 24'-3-oz.
Per doz. $4 00 4 25 5 50 7 00
Enterprise 16¾%
Parker .....50&5%

NAILS.

Cut Steel $4 45
Cut Iron 4 45
Wire.
Common $3 10
Cement Coated.
Small Lots 2 65
Horseshoe.
Ausable .....55&5%
Capewell 15%
Perfect .....55&5%
Putnam .....20&5%
Star .....30&5%
Picture.
Brass Heads 25%
Brads .....50&5%
Furniture .....List plus 15%

NETTING, POULTRY.

Galvanized before weaving...50%
Galvanized after weaving....40%

NIPPERS.

End Cutting.
Berg's (Swedish) In. 5 6
Per dozen..... $12 60 15 20
End and Diagonal Cutting.
Berg's (Swedish) In. 5 6
Per dozen $10 05 13 00
Hoof.
Heller's .....40&10%
V. & B., No. 52, each....$2 25

NOZZLES.

Hose.
Magic .....per doz. $9 50
Diamond ..... " 5 75

OILERS.

Chase Pattern.
Brass and Copper 10%
Zinc 20%
Railroad.
Coppered 33⅓%
Steel.
Copper Plated 50-10-5%

OPENERS.

Can.
Delmonico .....per doz. $1 30
Never Slip..... " 65
Crate.
V. & B. ..per doz. $7 25-11 00

PAILS.

Cream.
14-qt. without gauge,
.....per doz. $9 50
18-qt. without gauge,
.....per doz. 11 00
20-qt. without gauge,
.....per doz. 11 75
Sap.
10-qt., IC Tin....per doz. $4 00
12 " " " 5 50
Stock.
Galv. qts. 14 16 18 20
Per doz.$9 75 10 75 12 75 14 50

Water.
Galvanized qts. 10 12 14
Per doz.....$5 75 6 50 7 25
Wood.
Cable, 2-Hoop ...per doz. Nets
Cable, 3-Hoop ... " Nets
Cedar, 3-Hoop, brass " Nets

PANS.

Dripping .....Net
Fry.
Common .....Nets
Acme ..... "
Roasting.
Paxton,
Nos. 1 2 3 4
Per doz. .....Nets
Neverburn ..... "
Savory, No. 200..per doz. $3 40

PAPER.

Roofing. Per square
Mayor, 1-ply $1 33
" 2-ply 2 24
" 3-ply 2 65
Red Rosin .....per ton $111 45
Sand and Emery.
No. 1 per ream, best grade $5 40
No. 1, per ream, cheaper grade 4 35
Potato.
Goodell's Saratoga, 10⅛ in., doz. 6 50
Goodell's Saratoga, 5 in., doz. 5 50

PICKS.

Adze Eye Ore.....22½%
Drifting and Poll Picks...22½%
Plumbs, Railroad 22½%
Surface 22½%

PINCERS.

Carpenters', cast steel,
No..... 6 8 10 12
Each $0 56 0 72 $0 93 $1 02
Blacksmiths', No. 10.....$0 96
Heller's .....List plus 10%

PINS

Clothes.
Common, per box of 5 gro. $0 95
Picket.
Fluted, 15-in ....per doz. $1 10
Fluted, 21-in .... " 1 60
Spiral ..... " 1 90

PIPE.

Conductor.
Plain Round and Round Corrugated.
29 Gauge .....70&5%
28 " .....70&5%
26 " .....70&5%
24 " .....70&5%
Square Corrugated A and B and Octagon.
29 Gauge 65%
28 " 65%
26 " 65%
24 " 65%
Prices for Galvanized Toncan Metal, Genuine O. H. Iron, Lyonmore Metal and Keystone C. B. on application.
Stove. Per 100 joints
26 gauge, 5 inch E. C. nested 14 00
26 gauge, 6 inch E. C. nested 15 00
26 gauge, 7 inch E. C. nested 17 00
28 gauge, 5 inch E. C. nested 12 00
28 gauge, 6 inch E. C. nested 13 00
28 gauge, 7 inch E. C. nested 15 00
30 gauge, 5 inch E. C. nested 10 00
30 gauge, 6 inch E. C. nested 11 00
30 gauge, 7 inch E. C. nested 13 00
T-Joint Made up.
6-inch .....per 100 35 00
Furnace Pipe.
Double Wall Pipe and Fittings 40-10%
Single Wall Pipe, Round Pipe Fittings 40-10%
Galvanized and Back Iron Pipe, Shoes, etc.....40-10%
Milcor, galvanized .....Net

PLANES.

Stanley Iron Bench.....Net

PLIERS.

V. & B. No. 6.....each $0 52
" No. 7 Gas..... 0 55
" Double Duty 106 0 50
" Nut No. 3..... 0 60
Lineman's Side Cutting.
Berg's
(Swedish), In. 6 7 8
Blk. Pol. Face,
doz. $10 70 20 00 23 35
Long Nose Side Cutting.
Berg's (Swedish) In. 5 6
Blk. Pol. Face, doz. $12 25 15 20
Flat and Round Nose.
Berg's (Swedish)
Flat, In. 4 6 8
Blk. Pol. Face,
Doz. $8 90 13 35 19 65
Berg's (Swedish)
Round, In. 4 6 8
Blk. Pol. Face
Doz. $11 15 16 30 22 35

POINTS, GLAZIERS.

No. 1, 2 and 3.....per doz. 75c

POINTERS, SPOKE.

Stearns' No. 1 ....per doz. $10 00
" No. 2 .... " 12 00

POKERS, STOVE.

Wr't Steel, str't or bent,
..... per doz. $0 75
Nickel Plated, coil hand's " 1 10

PRESSES, FRUIT AND JELLY

Enterprise Manufacturing Co. 25%

PRUNERS.

Disston's Pole ....per doz. $18 00
Water's Improved, per doz. 60%

Nail.

Giant .....per doz. $14 50
Never-Slip .... " 17 00

PULLEYS.

Awning—Jap'd 10%
Clothes Line 10%
Hay Fork.
Iron Wheel, 5-in..per doz. $2 50
Wood Wheel, 6-in. " 3 65
Wood Wheel, 6-in., pass knot ..... " 3 00
Sash.
Common .....Net
Common-Sense, 2-in .....Net
Empire Pattern, 2-in.....Net
Ideal .....Net
Steel .....Net

PUMPS.

Spray.
Midget Junior....per doz. $3 75
New Misty ..... " 6 00
Crescent ..... " 6 50

PUNCHES.

Conductors.
No. 22 .....per doz. $3 00
Machine .....per lb. 25
Saddlers'.
Common..per doz. $1 50 to $5 00
Revolving Spring.
Stearns, No. 10..per doz. $ 8 00
" No. 40.. " 16 00
" No. 60.. " 19 00
Parker Metal Punch No. OX .....each $7 00
Whitney's Ball Bearing..
.....Prices on application

PARERS.

Apple.
Goodell's .....per doz. $10 80
Turntable ..... " 11 40
White Mountain " 8 40
Reading No. 78 " 11 40

PUTTY.

Commercial Putty, 100-lb. kits $4 75

RAKES.

Garden Per doz.
Steel, Bow, 12-inch Teeth $8 50
Steel, Bow, 14-inch " 9 25
Malleable Iron, 12-in. " 4 75
Malleable Iron, 14-in. " 5 00
Hay.
Wood, 10 Teeth.....$4 00
Lawn.
30 Teeth .....per doz. 5 50

RAZORS—SAFETY.

Gillette .....per doz. $45 00
Auto Strop ..... " 45 00
Gem ..... " 8 40
Gem (3 doz. lots).. " 8 00
Ever Ready ..... " 8 40
Ever Ready (3 dz. lots) " 8 00

RAZORS—STRAIGHT.

RAZOR STROPS.

Star (Honing) 50%

REGISTERS.

Cast Iron 25%
Steel and Semi-Steel.....40%
Baseboard 40%
Adjustable Ceiling Ventilators 40%
Register Faces—Cast and Steel
Japanned, Bronzed and Plated.
4x6 to 14x14.....40%
Large Register Faces—Cast, 14x14 to 38x42.....60%
Large Register Faces—Steel, 14x14 to 38x42.....60%

RIDGE ROLL.

Galvanized.
Crated 70-25%
Wired 70-25-5%
Milcor .....Net

RINGS AND RINGERS.

Pull.
Copper .....2½-in. 3-in.
Per doz. $2 40 $2 65
Rea's Improved Self-Piercing copper,
..... doz. $ 40
Steel, per doz..... 1 50 1 80
Fruit Jar.
White .....per lb. 80

RIVETS.

Copper Belt .....50% Discount
Coppered Iron 50%
Tinners' 50%
Hame .....per lb. $0 17
Slotted Clinch per doz. 60 @ 1 10
Tubular.
Nos. 1 and 2 assorted sizes, 50 in box.....doz. 75c
Nos. 1 and 2 assorted sizes, 10 in box.....doz. 1 40

ROPE.

Cotton.
¼, 5-16 in. Com. on reels, per lb. 80c
¼, 5-16 in. Com., in coils, per lb. 80c
Sisal.
1st Quality, base 14½c to 15½c
No. 2.....13c to 14c
Manila.
1st Quality standard brands .....17½c to 18½c
No. 2 .....16c to 16½c
Hardware Grade, per lb. 12¼c
Pure Manila.
1st Quality, base, per lb. .....17¾c to 18½c
Hardware Grade, per lb. 11½c

SAWS.

Butchers'.
Atkins No. 2, 14-in.....$12 30
" No. 2, 18-in..... 13 70
" No. 7, 16-in..... 15 30
" No. 8, 22-in..... 15 35
" No. 7, 20-in..... 17 30
" No. 7, 24-in..... 19 35
" No. 7, 28-in..... 21 40
Compass.
Atkins No. 2, 10-in.....$ 4 95
" No. 10, 10-in..... 5 10
" Blades, No. 2, 10-in. 2 95
" " No. 2, 10-in. 3 00
Cross-Cut.
Atkins No. 221, 4-ft..... 3 70
" No. 221, 6-ft..... 4 10
" No. 221, 8-ft..... 5 45
Flooring.
Atkins No. 96, 16-in..... 19 95
" No. 96, 20-in..... 21 85
Hand and Rip.
Atkins No. 54, 20-in..... 17 75
" No. 54, 26-in..... 22 10
" No. 53, 16-in..... 16 45
" No. 53, 20-in..... 20 80
" No. 53, 24-in..... 24 20
" No. 53, 28-in..... 28 60
" No. 53, 30-in..... 31 95
Keyhole.
Atkins No. 1, complete.. 2 80
" No. 2, complete.. 3 35
Miter Box.
Atkins No. 1, 4x20..... 29 70
" No. 1, 5x22..... 24 55
" No. 1, 6x22..... 38 35
Pruning.
Atkins No. 20, 12-in.... 7 70
" No. 10, 16-in.... 16 50
Wood.
Atkins No. 202..... 8 50
" No. 318..... 10 05
" No. 906..... 15 65
" No. 1509..... 18 40

SCOOPS

Hubbard Western Pattern Riveted.

Size	A	B	C	D
1..	$16 75	16 00	15 25	14 45
4..	17 85	17 10	16 35	15 60
6..	18 65	17 85	17 10	16 35

SCRAPERS.

Box.
Triangular No. 6 per doz. $6 25
Road.
Cubic ft. 7 5 3
With runners,ea. $7 00 6 50 6 20

SCREEN DOOR HINGES.

Cast Iron .....gross $13 00
Steel ..... " 9 50

SCREWS.

Bench.
Iron, Ins. 1 1½ 1 1½
$6 82 7 87 9 45 16 30
Wood, white maple, per doz. 6 00
Hand—Wood 50%
Hand Rail 22%
Jack 30%
Lag or Coach—all sizes, gimlet pointed 60%
Saw—Centennial,
Nos. 1 2 3 4
Per doz.....47c 55c 75c 90c
Wood.
F. H. Bright .....82½ & 20%
R. H. Blued .....80 & 20%
F. H. Jap'd .....75 & 20%
F. H. Brass .....77½ & 20%
R. H. Brass .....75 & 20%
Sheet Metal.
No. 7, ½x½, per gross..$ .55
No. 10, ⅜x3/16 per gross.. .75
No. 14, ⅛x¼ per gross.... .90

SCYTHES.

Clipper, Grass....per doz. $13 50
Honest Dutchman " 13 00

SETS.

Nail.
Square head.....per doz. 1 84
Cup point, knurled " 1 75
Rivet.
Farmers' 0 19
Tinners' 3-4 ..... 0 40
" 00-0 ..... 0 60
Saw.
Atkins No. 10....per doz. $3 80
" No. 12.... " 6 20
Disston's Monarch No. 2..... " 9 90
Disston's Monarch No. 12..... " 13 20
Leach's ..... " 80
Nash's Hand .... " 3 15
Nash's X-Cut .... " 4 20
Stillman's Lever.. " 1 30
Stillman's X-Cut.. " 2 50
Whiting Pattern, No. 21 ..... " 7 50
Eccentric Anvil, Hand No. 395, N. P. Norrill Pattern ..... " 14 50

SHEARS.

		Per Doz.
Nickel Plated, Straight,	6"	$12 90
" " "	7"	14 85
" " "	8"	16 80
Japanned, Straight	6"	11 00
" "	7"	12 40
" "	8"	13 80

SHEAVES, SLIDING DOOR.

Common. Inches	3	4	5
Per set	$1 40	1 75	2 40

Hatfield's.
Per set $1 80 2 10 2 75 25

SHINGLES.

Per Square
Zinc (Illinois) $15 00

SHOES.

Conductor 60%

SHOVELS AND SPADES.

Coal.
Hubbard's

No.	A	B	C	D
1	$16 00	15 10	14 45	13 70
2	16 35	15 60	14 85	14 10
3	16 75	16 00	16 25	14 45
4	17 10	16 35	16 60	14 85

Post Drains & Ditching.
Hubbard's

Size	A	B	C
14"	17 15	16 40	15 65
16"	17 50	16 75	16 00
18"	17 85	17 10	16 35
20"	18 20	17 45	16 70
22"	18 55	17 80	17 05

Alaska Steel.
D-Handle .....per doz. $3 50
Long Handle ..... " 3 00

SKATES.

Roller.
Ball Bearing—Boys' $1 50
Ball Bearing—Girls' 1 60

SNAPS, HARNESS.

Covered Spring .....Add 30%
Judd's Pattern Add 33 1-6% to list

SNATHS.

Double Ring Bush..per doz. $ 9 75
Patent Loop, Bush.. " 10 00
Patent Loop, Grass. " 8 75

SNIPS, TINNERS'.

Clover Leaf .....40&10%
National .....40&10%
Star 50%
Milcor .....Net

SPRINGS, DOOR.

Perfect.

Nos.	2	3	4	5	6	7
Per doz.	45c	50c	55c	65c	80c	90c

Reliance.

	Light	Medium	Heavy
Per doz.	$1 80	2 40	3 75

Torrey's .....per doz. 1 65

SPRINKLERS, LAWN.

Stearn's No. 1....per doz. $11 50

SQUARES.

Steel and Iron.....Net
(Add for bluing, $2.00 per doz. net)
Mitre ..... "
Try ..... "
Try and Bevel..... "
Try and Miter..... "
Fox's .....per doz. $6 00
Winterbottom's 10%

STAPLES.

Blind.
Barbed .....per lb. 21@22c
Butter, Tub ..... " 16@19c
Fence—
Polished .....per 100 lbs. $5 45
Galvanized ... " 6 15
Netting.
Galvanized ....per 100 lbs. 6 54
Wrought.
Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples .....50&10%
Extra heavy 35%

STONES.

Axe.

	per lb.	New	Nets
Hindostan			
More Grit	"	"	
Washita	"	"	

Emery.
No. 126.....per doz. New Nets
Oil—Mounted.
Arkansas Hard
No. 7 .....per doz. New Nets
Arkansas Soft " "
Washita No. 717 " "
Oil—Unmounted.

	per lb.	New	Nets
Arkansas Hard			
Arkansas Soft	"	"	
Lily White ..	"	"	
Queer Creek..	"	"	
Washita	"	"	

Scythe.

Black Diamond per gro.	New	Nets
Crescent	"	"
Green Mountain	"	"
LaMolle	"	"
Extra Quinnebog	"	"
Red End	"	"

STOPS, BENCH.

No. 10 Morrill pattern ..... per doz. $11 00
No. 11 Stearns pattern ..... " 10 00
No. 15 Smith pattern " 7 00

STOPPERS, FLUE.

Common .....per doz. $1 10
Gem, flat, No. 3... " 1 00
Gem. No. 1..... " 1 10

STRETCHERS.

Carpet.
Bullard's .....per doz. $3 90
Excelsior ..... " 5 25
Malleable Iron... " 70
Perfection ..... " 6 30
King ..... " 4 50
Wire.
O. S. Elwood, No. 1 per doz. Nets
O. S. Elwood, No. 2 " "

SWIVELS.

Malleable Iron .....per lb. $0 10
Wrought Steel ....per gro. 4 50

TACKS.

Bill Posters' 6-oz., 25-lb. boxes per lb. 15c
Upholsterers' 6-oz., 25-lb. boxes, per lb.....15½c

TAPES, MEASURING.

Asses' Skin .....List&40%

THERMOMETERS.

Tin Case.....per doz. 50c&$ 1 25
Wood Back... " $2 00& 12 00
Glass ..... " 12 00

TIES.

Bale.
Single Loop, carload lots .....75&7%
Single Loop, less than car lots .....70&15%

TRAPS.

Game with Chains.	Per doz.
Victor No. 1.....	$1 83
Onelda Jump No. 1.....	2 20
Newhouse No. 1.....	4 38

Mouse and Rat.	List per gross.
Sure Catch Mouse Traps.	$ 2 70
Vim Mouse Traps.....	2 70
Short Stop Mouse Traps.	2 20
Wood Choker Mouse Traps, 4 hole.....	17 00
Sure Catch Rat Traps....	16 00
Vim Rat Traps.....	16 00
Short Stop Rat Trap....	15 00
Dead Easy Rat Traps....	17 00
Star Rat Traps.....	50 00
Erie	54 00

Packed in One Bushel Band Stave Baskets.

	List per bushel.
Sure Catch Mouse Traps (360 Traps)	$ 9 30
Short Stop Mouse Traps (360 Traps)	8 00
Sure Catch Rat Traps (54 Traps)	6 00
Short Stop Rat Traps (54 Traps)	5 60

Assorted Mouse and Rat Traps.

	List per bushel
Sure Catch (216 Mouse Traps and 26 Rat Traps)	$8 50
Short Stop (216 Mouse Traps and 26 Rat Traps)	7 50

TROWELS.

Cement.
Atkins No. 6..... 19 50
" No. 9..... 25 50
Disston's 30%

TUBS, WASH.

Standard, Wood.				Ex.
Nos. ..	3	2	1	large
Per doz.	$9 50	11 25	12 75	15 50

Galvanized.			
No.	1	2	3
Per doz. ...13 75	15 95	18 60	

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TWINE.

White Cotton.
Eureka, 4-ply.....per lb. 30c
Jute.
3-ply and 6-ply Bale Lots.22½c

VALLEY.

Formed Valley Galvanized Steel 60-5%
Milcor .....Net

VISES.

No. 700, Hand.

Inches	4½	5	5½
Doz.	$11 15	13 00	14 85

No. 701. In.

	4	5	6
Doz.	$11 15	13 00	16 70

No. 1, Genuine Wentworth, Noiseless Saw....per doz. 15 00
No. 2, Genuine Wentworth, Noiseless Saw....per doz. 22 50
No. 3, Genuine Wentworth, Noiseless Saw....per doz. 20 00
No. 500, All Steel Folding Saw .....per doz. 16 00

WASHERS.

Standard O. G. cast iron, per lb. 3¾c
Wrought steel in 5-lb. boxes, per lb.:

In.	3/16	¼	5/16	⅜	½
	15c	14c	12c	11c	10c
	⅝	¾	⅞	1	
	9¼c	9c	8c	8c	

WEDGES.

	per doz.	Nets
Ax.		
Galling	.....per lb.	Nets
Saw	.....per lb.	8½

WEIGHTS.

Hitching .....per lb. Nets
Sash—f. o. b. Chicago.
Ton lots, per ton.....$36 00
Smaller lots, per ton..... 37 50

WHEEL BARROWS.

Common Wood Tray.....$3 00
Steel Tray 4 50
Angle leg, garden..... 5 75

WHEELS

Carborundum 60%
Emery 60%
Well, Ins..... 8 10 12
Per doz.....$5 50 7 25 8 50
12-in. heavy hoisting, per doz. $25 00

WIRE.

Black annealed wire, No. 8 per 100 lbs.....$2 85
Galvanized barb wire, per 100 lbs. 3 25
Wire cloth — black painted, 12-mesh, per 100 sq. ft.... 1 90
Cattle Wire—galvanized catch weight spool, per 100 lbs. 3 65
Galvanized Hog wire, 80 rod spool, per spool..... 3 23
Galvanized plain wire, No. 8, per 100 lbs..... 3 35

WOOD FACES.

50% off list.

WRENCHES.

Coes Steel Handle,	6-in....	60%
" " "	8-in....	60%
" " "	10-in....	60%
" " "	12-in....	60%
Coes Knife-Handle,	6-in....	60%
" " "	8-in....	60%
" " "	10-in....	60%
" " "	12-in....	60%

Coes All Patterns.....60%

Knife Handle Pattern.
No. 63, Screw Wrench, List plus 30%
No. 60, Steel Handle.....30%

WRINGERS.

No. 790, Guarantee, per doz.		$49 50
No. 770, Bicycle....	"	47 00
No. 670, Domestic..	"	43 50
No. 110, Brighton...	"	39 00
No. 750, Guarantee.	"	51 00
No. 740, Bicycle....	"	48 50
No. 22, Pioneer....	"	35 50
No. 2, Superb....	"	25 50

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Lamneck Co., W. E., Columbus, Ohio
Manny Heating Supply Co., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
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Rod Clips—Damper.
Parker Supply Co., New York, N. Y.

Rods—Stove.
Kirk-Latty Mfg. Co., Cleveland, Ohio

Rolls—Forming.
Bertsch & Co., Cambridge City, Ind.

Roof—Flashing
Hessler Co., H. E., Syracuse, N. Y.

Roofing—Iron and Steel.
American Rolling Mill Co., Middletown, Ohio
Burton Co., W. J., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Inland Steel Co. Chicago, Ill.
Sykes Co., The Chicago, Ill.

Roofing—Zinc.
Illinois Zinc Co., New York, N. Y
New Jersey Zinc Co., The, New York, N. Y.

Rubbish Burners.
Hart & Cooley Co., New Britain, Conn.

Schools—Sheet Metal Trades.
Zideck School of Sheet Metal Trades, New York, N. Y.

Schools—Sheet Metal Pattern Drafting.
St. Louis Technical Institute, St. Louis, Mo.
Zideck Auto Radiator School, New York, N. Y.

Schools—Automobile Radiator Repairing.
Zideck Auto Radiator School, New York, N. Y.

Screens—Perforated Metal.
Harrington & King Perforating Co., Chicago, Ill.

Screws—Sheet Metal.
Parker Supply Co., New York, N. Y.

Shears—Hand and Power.
Philadelphia, Pa.
Ewert & Kutscheid Mfg. Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Viking Shear Co., Erie, Pa.

Sheets—Asbestos
Manny Heating Supply Co., Chicago, Ill.

Sheets—Black and Galvanized.
American Rolling Mill Co., Middletown, Ohio
Inland Steel Co., Chicago, Ill.
Osborn, The J. M. & L. A., Cleveland, Ohio
Sykes Co., The, Chicago, Ill.

Sheets—Iron.
American Rolling Mill Co., Middletown, Ohio

Shields—Radiator.
Thomas & Armstrong Co., The London, Ohio

Shingles—Zinc.
Illinois Zinc Co., New York, N. Y.

Sifters—Ash.
Diener Mfg. Co., G. W., Chicago, Ill.

Sifters—Flour.
Meyers Mfg. Co., Fred J., Hamilton, Ohio

Sky Lights.
Burton Co., W. J., Detroit, Mich.
Sykes Co., The. Chicago, Ill.

Smoke Pipe—Cast Iron.
Manny Heating Supply Co., Chicago, Ill.
Waterloo Register Co., Waterloo, Iowa

Solder.
Chicago Solder Co., Chicago, Ill.

Soldering Furnaces.
Ashton Mfg. Co., Newark, N. J.
Bernz Co., Otto, Newark, N. J.
Burgess Soldering Furnace Co., Columbus, Ohio
Clayton & Lambert Mfg. Co., Detroit, Mich.
Diener Mfg. Co., G. W., Chicago, Ill.
Double Blast Mfg. Co., North Chicago, Ill.
Hones, Inc., Chas. A., Baldwin, Long Island, N. Y.
Quick Meal Stove Co., St. Louis, Mo.
Turner Brass Works, Sycamore, Ill.

Specialties—Hardware.
Atkins & Co., Inc., E. C., Indianapolis, Ind.
Bullard & Gormley, Chicago, Ill.
Diener Mfg. Co., G. W., Chicago, Ill.
Hardware Specialty Co., Fort Wayne, Ind.
Heller Bros. Co., Newark, N. J.
Hessler Co., H. E., Syracuse, N. Y.
Hyfield Mfg. Co., New York, N. Y.
Lovell Mfg. Co., Erie, Pa.
Parker Supply Co., New York, N. Y.
Standard Fdy. & Mfg. Co., Kansas City, Mo.
Vaughan & Bushnell Mfg. Co., Chicago, Ill.
Walchli Mfg. Co., St. Louis, Mo.

Sporting Goods.
Bullard & Gormley, Chicago, Ill.

Stains—Oil and Acid.
Federal Varnish Co. Chicago, Ill.

Stars—Hard Iron Cleaning.
Fanner Mfg. Co., Cleveland, Ohio

Statuary.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.

Stoves—Camp.
Quick Meal Stove Co., St. Louis, Mo.

Stoves—Gasoline and Kerosene.
American Stove Co., St. Louis, Mo.
Clark & Co., Geo. M., Chicago, Ill.
Dangler Stove Co., Cleveland, O.
Quick Meal Stove Co., St. Louis, Mo.

Stoves and Ranges.
American Stove Co., St. Louis, Mo.
Clinton Furnace Stove Co., Clinton, Ind.
Copper Clad Malleable Range Co., St. Louis, Mo.
Hoosier Stove Co., Marion, Ind.
Gohman Bros. & Kahler, New Albany, Ind.
Independent Stove Co., Owosso, Mich.
Jungers Stove & Range Co., Grafton, Wis.
Malleable Iron Range Co., Beaver Dam, Wis.
Michigan Stove Co., The, Detroit, Mich.
Orbon Stove Co., Belleville, Ind.
Quick Meal Stove Co., St. Louis, Mo.
Standard Fdy. & Mfg. Co., Kansas City, Mo.

Stove Pipe Reducer.
Sullivan-Geiger Co., Indianapolis, Ind.

Tacks, Staples, Spikes.
American Steel & Wire Co., Chicago, Ill.

Tiles and Shingles—Metal.
Burton Co., W. J., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Hopson Co., W. C., Grand Rapids, Mich.
Illinois Zinc Co., New York, N. Y.
Milwaukee Corrugating Co., Milwaukee, Wis.
Thomas & Armstrong Co., The, London, Ohio

Tinplate.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Tin—Perforated.
Harrington & King Perforating Co., Chicago, Ill.

Tools—Auto Repair.
Curfman Mfg. Co., F. L., Maryville, Mo.

Tools—Carpenter.
Atkins & Co., Inc., E. C., Indianapolis, Ind.
Vaughan & Bushnell Mfg. Co., Chicago, Ill.

Tools—Tinsmith's.
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Ewert & Kutscheid Mfg. Co., Chicago, Ill.
Hopson Co., W. C., Grand Rapids, Mich.
Maplewood Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Vaughan & Bushnell Mfg. Co., Chicago, Ill.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill
Whitney Metal Tool Co., Rockford, Ill.

Torches.
Ashton Mfg. Co., Newark, N. J.
Bernz Co., Otto, Newark, N. J.
Burgess Soldering Furnace Co., Columbus, Ohio
Clayton & Lambert Mfg. Co., Detroit, Mich.
Diener Mfg. Co., G. W., Chicago, Ill.
Double Blast Mfg. Co., North Chicago, Ill.
Hones, Inc., Chas. A., Baldwin, Long Island, N. Y.
Quick Meal Stove Co., St. Louis, Mo.
Turner Brass Works, Sycamore, Ill.

Transit Companies.
Cleveland & Buffalo Transit Co., Cleveland, Ohio

Trimmings—Stove.
Fanner Mfg. Co., Cleveland, Ohio

Valves—Humidifier.
Haynes, Kansas City, Mo.

Varnishes.
Cornish & Co., J. B., Chicago, Ill.
Federal Varnish Co., Chicago, Ill.

Ventilators.
Berger Bros. Co., Philadelphia, Pa.
Friedley-Voshardt Co., Chicago.
Messenger & Parks Mfg. Co., Aurora, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.
Standard Ventilator Co., Lewisburg, Pa.
Thomas & Armstrong Co., The, London, Ohio

Ventilators—Ceiling.
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Tuttle & Bailey Mfg. Co., New York

Water Heaters—Oil Burning.
Dangler Stove Co., Cleveland, O.

Wire.
American Steel & Wire Co., Chicago, Ill.

Wrenches.
Coes Wrench Co., Worcester, Mass.

Wringers—Clothes.
Lovell Mfg. Co., Erie, Pa.

Zinc.
Illinois Zinc Co., New York, N. Y.
New Jersey Zinc Co., The, New York, N. Y.

Zinc—Slab.
Illinois Zinc Co., New York, N. Y.

WANTS AND SALES

For paid yearly subscribers, AMERICAN ARTISAN AND HARDWARE RECORD will insert under this head advertisements of not more than fifty words *WITHOUT CHARGE*. Employers wishing to secure employes, parties desiring to purchase or sell business, secure partners, or to exchange, etc., will find that these pages offer excellent opportunities to satisfy their wants. Clerks and tinsmiths looking for situations will find it to their advantage to use these columns. Those who respond to these announcements please mention that they "READ THE ADVERTISEMENT IN AMERICAN ARTISAN AND HARDWARE RECORD."

BUSINESS CHANCES

Lightning Rods—Sell our famous Copper Cable and Section Rods—endorsed and labeled by Underwriter's Laboratories. Special Patented One Piece Air Terminals —and many other exclusive features with Rock Bottom Prices. Don't do all the hard work and let your competitor put on the rods. Write today for agency. L. K. DIDDIE CO., Marshfield, Wis.

For Sale — Patent Pending Grain Sprouter, Lighter, Heater and Water Heater combined for chicken house. For prints and specifications address C. M. Scharff, Polo, Illinois. 8-3t

For Sale—A small stock of hardware, floor cases and shelving. A real bargain. Address B-60, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 8-3t

For Sale—Plumbing tools in first class condition. Stock and dies, wrenches, cutters, chisels, etc. A bargain if taken at once. Address Holyoke Radiator Repair Shop, Holyoke, Colo. 8-3t

Business Chances—A first class sheet metal worker, capable of handling shop and men would consider partnership in going concern, or would rent or manage on commission basis. Address with full particulars B-57, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 7-3t

For Sale—Sheet metal shop and furnace business. Old established shop doing a good business all year round. A big bargain for quick sale. Will arrange terms for responsible party. Owner has other business that needs his attention. Atlas Sheet Metal Works, 13 West Illipois St., Chicago, Ill. 9-3t

For Sale—Tools and stock of sheet metal goods, will invoice about $3000. Shop now on good paying basis, in Texas town of over 40,000 inhabitants, only one competitor. Would sell one-half interest to mechanic competent to manage business. Address B-61, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 8-3t

For Sale — The best equipped sheet metal shop in the city of Muncie, Indiana. Located in a fine corner room in the main part of town. A dandy layout and place for general work and warm air heating. A small amount of capital will handle this. For information and reason for wanting to sell address I. B. Allen, 425 E. Main St., Muncie, Indiana. 9-3t

For Sale—A clean stock of general hardware in a small town in South Dakota. Good farming country and large territory. Four years ago they raised as much as 52 bushels wheat per acre. Two churches and high school. A good chance for a tinner to make money. Reason for selling, am retiring. Address B-59, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 7-3t

BUSINESS CHANCES

For Sale—Sheet Metal Shop. Have been established four years. Will take $800 cash, Ford Truck included. Ravenswood Sheet Metal Shop, 2018 Lawrence Avenue, Chicago, Illinois. 9-3t

For Sale—Patent rights for Galv. Iron Garbage Box, can be placed in fence or wall, conveniently reached from either side. Or will let out on royalty. For particulars address Charles Zitko, 3524 Lindell Blvd., St. Louis, Mo. 9-3t

For Sale or Exchange—A good Stock and Grain Farm of 333½ acres located in Iowa. Want good Hardware Store in good location or will consider Hardware and General Store. For particulars write J. M. Cornette, Kewanee, Ill. 7-3t

Wanted—As partner in going heating and plumbing concern, a man having ample experience in those lines. Must have enough capital so as to insure financial responsibility. Address B-62, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 9-3t

HELP WANTED

Wanted—Tinners for general sheet metal and roofing work. Steady work. Address Geisler Brothers, 5th and Locust Streets, Dubuque, Iowa. 7-3t

Wanted—Plumber and Tinner to handle shop in connection with hardware store. Steady job for the right man. Renning Hdw. Co., Shell Rock, Iowa. 8-3t

Help Wanted — Tinsmiths and sheet metal workers to manage radiator core-making shops, city or country. $500 will establish you in business. Address Zarco Mfg. Co., 413 East 91st Street, New York City. 8-3t

Wanted—At Once—First class tinner and furnace man. Steady work and good living conditions. Wire, write or come. Union shop. Bloomington Radiator and Sheet Metal Works, Bloomington, Indiana. 7-3t

Wanted—We can use several good tinners and furnace men. State wages wanted in first letter also experience, references, etc. There is no labor trouble here. The Klinsmann Co., Fargo, North Dakota. 8-3t

Wanted—Three first-class all around sheet metal workers in South. $1 per hour; steady work. State if union or non-union. Address B-63, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 9-3t

Wanted—At Once—Sheet metal worker experienced in Cornice and Ventilation. Must be able to work from blue prints and lay out own work. Give full particulars in first letter. H. J. O'Neill, 219 South Broadway, Rochester, Minnesota. 7-3t

Wanted—At Once—An A-1 tinner and furnace man, must be good workman able to lay out and do work that comes into ordinary all around tin and furnace shop. Steady work and good pay to right man. Wire. R. H. Vandevelde & Co., Dyersburg, Tennessee. 7-3t

Wanted—At Once—Three good all around sheet metal workers who can do furnace work. Good job and wages to the right men. Mostly inside work. Open shop. No labor trouble. Jewett Cornice & Roofing Co., 602-604 Market Street, San Antonio, Texas. 7-3t

Wanted—Foreman to take charge of general sheet metal shop in South working from 15 to 25 men. Must be a hustler and competent. Give full information first letter. Attractive position for right man. Address B-64, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Ill. 9-3t

Wanted—Tinner or a combination tinner and plumber for in and outside work. Must understand business. Married man preferred; one that would like to settle down in a small town. Must be a steady man; no loafers required. If interested write, giving wages and other details. Farmers Hardware, Thorpe, Wisconsin. 9-3t

HELP WANTED

Wanted—A good all around tinner and furnace man. Please state wages wanted in first letter. Opie M. Hocker, El Paso, Illinois. 9-4t

Wanted—First class tinner and sheet metal worker, one who understands the installation of War Air Heaters. Steady position for right party. Address Geo. W. Howell, 310 W. Third St., Greensburg, Pa. 8-3t

Wanted—At once. Two first class all around tinners, must be good furnace installers. Also two first class sheet metal workers for Ventilating and Blow Pipe work. Steady work. Union shop, $1 per hour. Standard Sheet Metal Works, Water and Genesee St., Waukegan, Ill. Phone 2101. 9-3t

SITUATION WANTED

Situation Wanted—By an all around tinner and furnace man capable of taking full charge of shop and managing same. Am middle age and want a steady place. State particulars, also wages. Illinois preferred. Address G. W. Corman, 406 East Park Place, Peoria, Illinois. 7-3t

Situation Wanted—By September 1st. Sheet Metal worker with 18 years' experience in general lines, including cornice, furnace, jobbing and special work. First class shop man and pattern cutter. Address B-58, care of AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 7-3t

Situation Wanted — By a good all around sheet metal worker. Can do furnace work, heating and ventilating. Also some plumbing. If you think you can use an honest, hard worker, reply, stating hours and wages. Good habits. Address The Tinner, 1120 Williamson St., Madison, Wisconsin. 9-3t

Situation Wanted — By a good all around tinner and furnace man. Can do radiator repairing, plumbing and steam fitting or almost anything that comes to a shop. Have a family. Want a steady job or would run shop on commission basis in a good town. Northwest preferred. H. Sletten, Box 285, Palouse, Wash. 9-4t

TINNERS' TOOLS

Wanted—Second-hand back gauge for 30-inch Niagara squaring shears. Joe Lauth, 411 North Mill St., Pontiac, Ill. 9-3t

For Sale—1 Wright's 30" Stove Pipe Folder; 1 Packham Stove Pipe Crimper; 1 Peck Stow & Wilcox No. 518 Rapid Grooving Machine and 1 Pair Gutter Tongs. F. L. Curfman Mfg. Co., Maryville, Mo. 9-3t

For Sale—Set of tinner's tools in good condition. This includes small motor and air compressor and other tools for doing radiator repair work. Three hundred dollars takes the outfit. Other interests require my attention, reason for selling. Address S. I. Applegate, 400 4th St., Du Bois, Pa. 8-3t

Wanted—Tinsmiths and sheet metal workers to get acquainted with two of the best books ever written for them. You don't like to read dry stuff that is uninteresting and hard to understand. That's where these books shine. They tell you what you want to know and in a style you like. They give you all the "Kinks" of the trade. Volume 1 has 119 pages and about 100 illustrations. Vol. 2 has 120 pages and 114 illustrations, and has special articles on repairing automobiles and erecting metal ceilings. These books are small and easily fit in your pocket. The "Kinks" books are durably bound in cloth and sell for $1.00 each. All books postage prepaid. No books exchanged. Ask for a copy of our new 10-page book catalog. AMERICAN ARTISAN, 620 South Michigan Boulevard, Chicago, Illinois.